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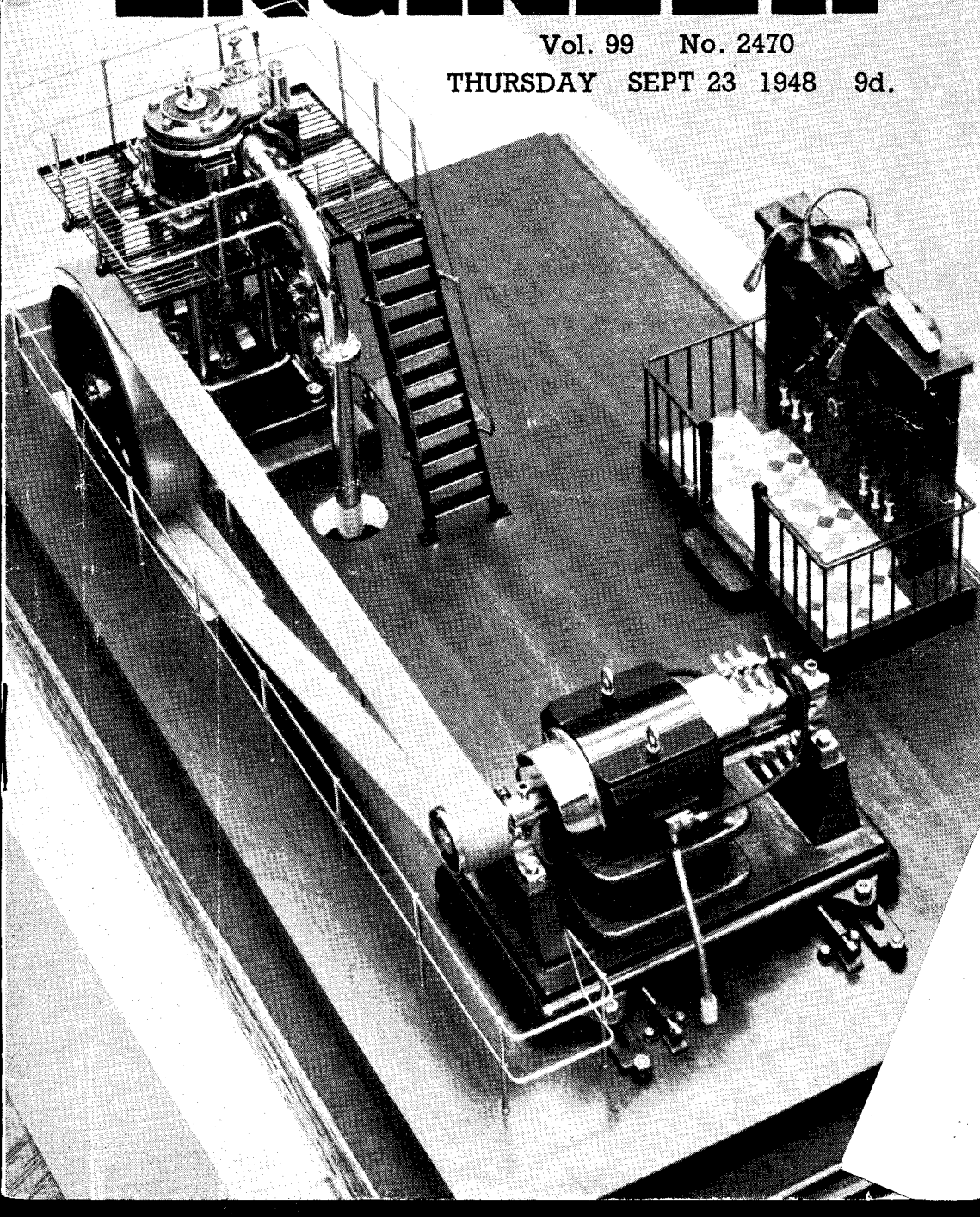


The MODEL ENGINEER

PERCIVAL MARSHALL & CO. LTD., 23, GREAT QUEEN ST., LONDON, W.C.2

23RD SEPTEMBER 1948 VOL. 99 NO. 2470

SMOKE RINGS

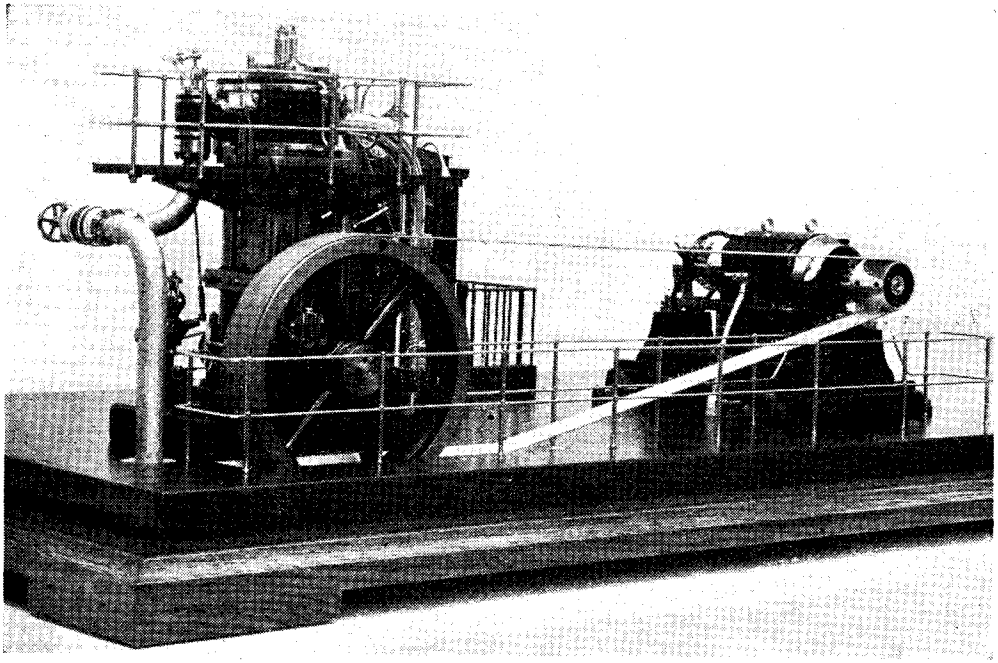
A Warning

● WE WERE surprised to learn the other day that it is not an uncommon occurrence at the Round Pond, Kensington, for models to be lifted out of the water on arrival at the bank and carried away while their owners are hastening round from the other side. Others have lost models by leaving the pond side while the model was more or less stationary in the middle. Some years ago, my small son and I were sailing a square-rigged model on the Round Pond when it got in irons and drifted helplessly out of reach. We left it and went up to the West End to have tea, returning about two hours later to find it still drifting, but gradually approaching the bank where we secured it after another hour's waiting. On a similar occasion recently, one of our readers was less fortunate. He was sailing his model, and about 7 p.m. pushed it out from the bank for a final run. The wind dropped; the ship lay becalmed quite out of reach. The usual "rescue boat" was locked up in its shed, the attendant having gone home with the key, so after waiting until it was dark, the owner went home. He came down to the pond next morning before 6 a.m., only to find that the boat was missing. On enquiring of the park attendants, he was told that they had seen nothing of it and that probably it had been "collected" earlier by someone who had spotted it the night before. The model is of a Barking ketch of 1830, and its quality may be judged by the fact that it had just won a bronze medal in the recent "M.E." Exhibition. It has an old-type hull with counter and straight stem, and is about 3 ft. long overall, including the bowsprit. It represents many hours of research and careful craftsmanship, and the owner is naturally anxious for its recovery. If any of our readers should see this model being sailed in or near London, and would inform the owner, Mr. G. A. White, of 21, Meadway Court, N.W.11, he, and the model yachting fraternity generally, would esteem it a great favour.—E.B.

A Contrast Indeed

● IN THE course of conversation with Mr. H. C. Powell, who won the Locomotive Championship Cup at this year's "M.E." Exhibition, I said that I wished that somebody would build a 7¼-in. gauge version of the old L.N.W.R. "Jumbo" type of engine. Rather to my surprise, Mr. Powell jumped at the idea and said definitely that his next engine would be a "Jumbo." Even if the workmanship and finish are the same as in Mr. Powell's *Duchess of Buccleuch*, the result will be a contrast indeed! For the "Jumbo's," or, to give them their official title, the "Precedents," were 2-4-0 type express passenger engines

with 6 ft. 9 in. coupled wheels, cylinders 17 in. in diameter by 24 in. stroke, a small but efficient boiler and an adhesion weight of about 36 tons. They were very great favourites of mine, and I was always fascinated by their speed capabilities ; no other 2-4-0 type of engine gave quite the same impression of alertness and sprightliness when



running. One engine I have particular reason to remember was named *Gazelle*, and her driver said to me one day, " She runs like one, too ! " But they were all grand little engines, famous the world over and well worth reviving in miniature.—J.N.M.

Road Transport Models Wanted

● I HAVE received from the editor of the well-known journal *Transport World* an appeal for the loan of scale model 'buses, trolley 'buses, luxury coaches and rail cars. These are required to lend attraction and additional interest to the stand which this journal will occupy at the Commercial Motor Transport Exhibition at Earls Court from October 1st to 9th. The editor tells me that any reasonable hiring fee for the period will be paid, and transport in the London area can be arranged.

If owners of any such models would write to Mr. P. Browne, Technical Editor, *Transport World*, 287, Streatham High Road, London, S.W.16, enclosing, if possible, a photograph of the model they have to offer, Mr. Browne would be very glad to hear from them.—P.D.

Crackle Enamel Finish—An Offer

● IN THE cover picture story describing the watchmakers' tools exhibited by Mr. O. Lindqvist, of Sweden, I referred to the excellence of the grey crackle enamel finish. As a result of this reference, I have now received a letter from Mr. J. Gordon Hall, of The Gordon Instrument Co. Ltd., Clinton Place, William Street, Sheffield, 10. Mr. Hall tells me his firm have the process of stoving crackle finishes in grey, black and signal red in constant operation. He states that usually spare oven space is available, and for amateurs he has generously offered to include small items with a top weight limit of 6 lb. per piece, at cost price. Mr. Hall gives warning, however, that no item which is soft-soldered can be finished in this manner, as in order to get the proper glass-hard surface the temperature is raised to just about the melting point of soft solder. He has also offered at a later date to write a short article describing the process.—P.D.

Our Cover Picture

● THE MODEL in our cover picture, another view of which is shown on this page, is a beautifully executed working miniature electric power station. It comprises a vertical steam engine driving an electric dynamo, and a switchboard control panel. The details and finish are really superb, and so far as I could see, the only part which does not function exactly like the real thing is the miniature clock over the switchboard.

This model by Mr. A. F. Winter, of Portslade-by-Sea, was awarded a bronze medal and the prize of five guineas donated by Messrs. A. J. Reeves & Co. for the best model steam engine in its class.

My congratulations to Mr. Winter and thanks for the pleasure I enjoyed examining his lovely handiwork.—P.D.

The George Stephenson Centenary Commemoration

by W. J. Hughes

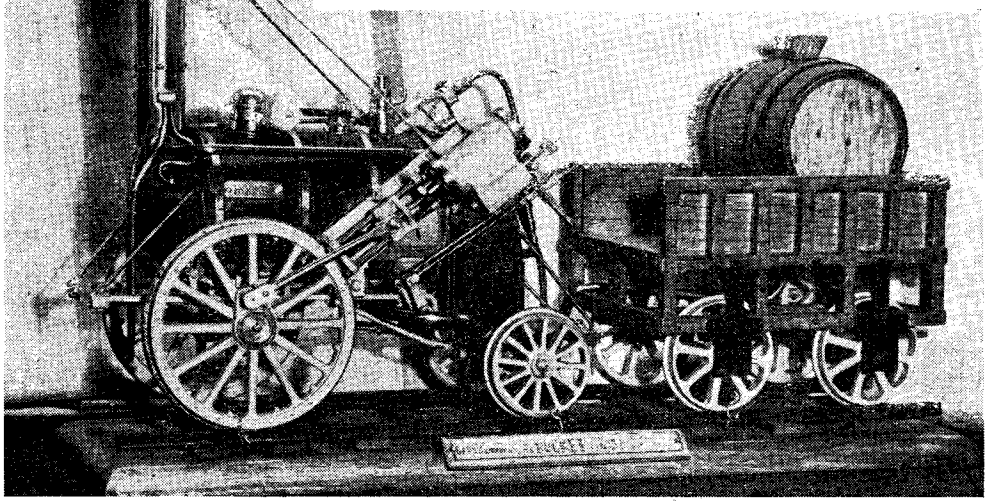


Photo by [*Press Photo Agency, Sheffield*

Photo No. 1.—" The Rocket," a working model built to 1-in. scale by G. H. Smithers, of Leeds. Most appropriate to the Exhibition!

ON August 12th, 1848, George Stephenson, " father of British railways," died at Tapton House, Chesterfield ; and the townsfolk of all classes paid tribute to this great man as he was laid to rest in Holy Trinity Church.

On August 12th, 1948, the Borough of Chesterfield opened a Centenary Commemoration to honour his memory, and it must be said that the organisation of the whole thing was worthy of the occasion, thanks to the co-operation of all concerned.

First, however, it may not be out of place to recall a few highlights in the great man's career. He was born in 1781, the second child of six, who with their parents lived and slept in a single room of a poor cottage about eight miles from Newcastle-on-Tyne. His first wages were twopence a day, earned at a tender age for minding cattle, but at twelve years of age he found work at the coal mine at sixpence per day. After becoming a fireman at the pit, he was appointed brakesman at the Dolly Pit at one pound per week. This was at the age of twenty, and he could only just sign his name, having attended night-school to learn to read and write.

When twenty-one, he took charge of a mine-engine at Willington, six miles from Newcastle, and it was here that his son Robert was born in 1803. Later, at Killingworth, he became well known for his mechanical skill, and at thirty-one was receiving £100 a year as colliery engine-wright. It is interesting to note that he invented a safety-lamp for mines which pre-dated Sir Humphrey Davy's, though Davy received the Government award of £2,000, and Stephenson received £100 in recognition of his services. Indignant well-wishers raised a subscription fund, and he was presented with £1,000, part of which later was to form his contribution to the firm of Robert Stephenson & Co., founded in 1823.

In 1821, when the Stockton & Darlington Railway was mooted, Stephenson was largely responsible for persuading the promoters to use steam locomotion, and three engines were built by R. Stephenson & Co., the line being opened to goods traffic in 1825. Meanwhile the firm of George Stephenson & Son had been set up as builders of railways, *not* of engines. The rest of his capital went into this firm.

For various reasons the Bill to promote the Manchester & Liverpool line was withdrawn, and Stephenson, who had been appointed engineer, was dismissed. On a second presentation, the Bill was passed, and it was found necessary to reinstate Stephenson to carry the project through. This was where his celebrated struggle with Chat Moss took place. His salary was now £1,000 a year.

The Rainhill trials should need no description

here, though it is worth recalling that the *Rocket* travelled with a full load at 29 m.p.h., instead of the 10 m.p.h. specified. Later, running light, she achieved 35 m.p.h., and one can imagine the elation of the builder as he stood at the throttle on this exhilarating occasion.

From then on Stephenson went from strength to strength, both in England and abroad. He was now well-off, but was not interested in wealth alone and refused many chances of making money. However, while building the Clay Cross Tunnel, near Chesterfield, he became interested in the mineral wealth of the area, and formed the Clay Cross Coal & Iron Co. Tapton House was included in one of the leases acquired by the company, and he made it his home.

Always willing, nay, eager to help talent and to listen to ideas, good or bad, he was a leading light in founding the Institution of Mechanical Engineers, partly with the idea of advising and helping those who were worthy of such assistance.

It was while surveying in Spain that he contracted the pleurisy which ravaged his health, and to which, two years later, was attributed the haemorrhage which caused his death.

It is recorded that at the outset of his career he had said he would make it possible for a man to breakfast in Edinburgh and have supper in London—this at a time when the journey was one of days! How well he succeeded we know, and his name as "father of railways" will be long remembered, not only in Britain, but throughout the world.

The Engineering Exhibition

The celebrations were held for fifteen days, comprising memorial services, cinema shows and exhibitions of engineering, railways, mining, documents, etc. An excellent brochure had been prepared, and with the aid of the map contained therein it was an easy matter to find the various places.

In the Engineering Exhibition, stands were occupied by seven large engineering firms, by the Chesterfield Technical College, and by the Chesterfield Model Engineering Society. To your scribe, of course, the stand of the latter proved an irresistible magnet, and there were many fine exhibits, too numerous to describe in the space available, though the photographs will give a good idea of the quality of the work. The inch-scale working model of the *Rocket* by Mr. G. H. Smithers, of Leeds, was very attractive, as was the 1½-in. scale "Blenkinsop" locomotive lent by Mr. H. Murray, of Ocknield. The original Blenkinsops had cast-iron boilers of oval section, 9 ft. 8 in. long, with two vertical cylinders 9 in. bore by 22 in. stroke. The return connecting-

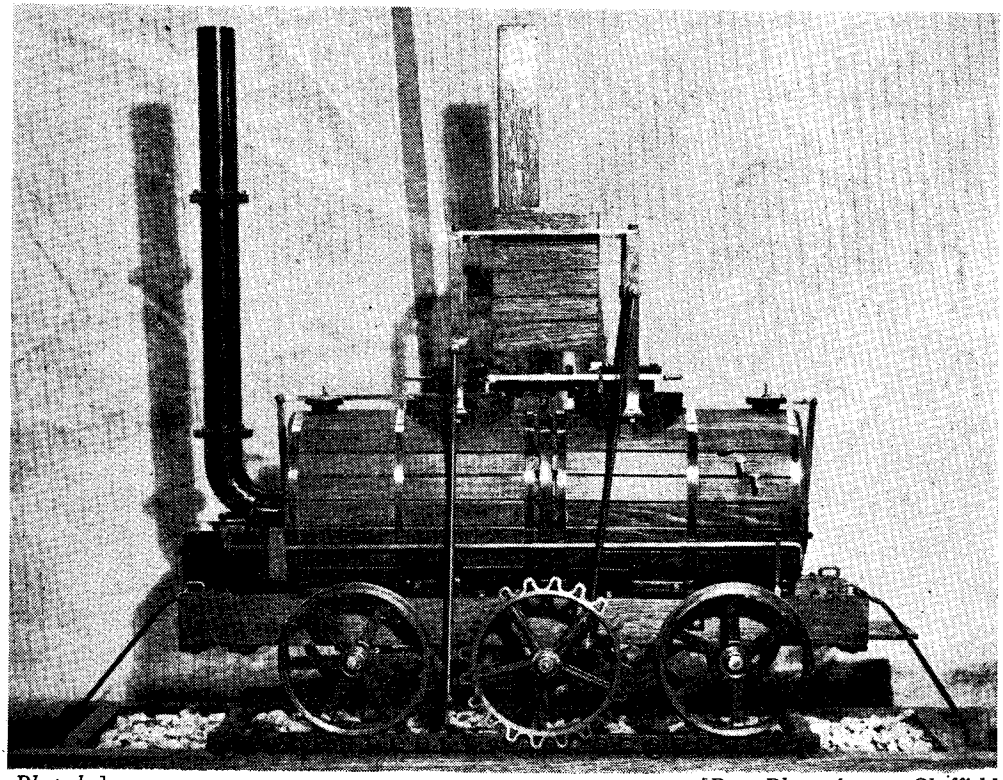


Photo by] [*Press Photo Agency, Sheffield*

Photo No. 2.—Model "Blenkinsop" locomotive, one-eighth full-size, lent by H. Murray. This model, too, is capable of running under its own power

rods drove crankshafts on which were mounted spur-gears driving the central shaft at half-speed. On this was mounted the spur-wheel which engaged with the rack on the cast-iron rails. The carrying wheels were 35 in. diameter and the wheelbase 7 ft. 4 in., the rail gauge being 4 ft. 1½ in. On the level the 5-ton locomotive could haul 94 tons at 3½ m.p.h., or 15 tons up 1 in 18. Four of these locomotives were built by Fenton, Murray and Woods in 1812-13, remaining at work for 20 years.

The triple-expansion engine shown in Photograph No. 3 was built in 1902 by Chesterfield's oldest member, and a fully-automatic steam hammer is his latest effort. One of Chesterfield's "younger end" is Mr. J. C. Rixley, who exhibited a "Bantam Cock" and a "Juliet," and who now, at the age of 21, is building an inch-scale South African locomotive. Another "Juliet," built by Mr. A. H. Kay (whom I had the good fortune to meet on the stand), is the subject of Photograph No. 4.

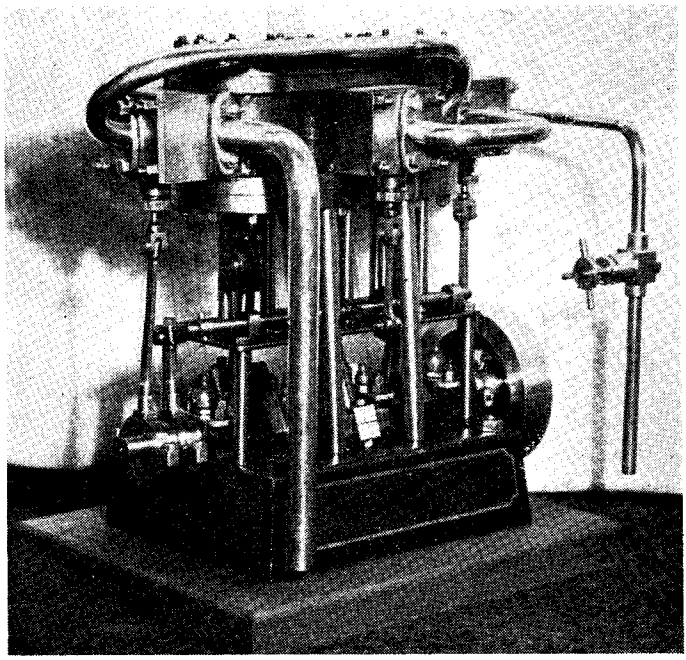


Photo by [*Press Photo Agency, Sheffield*

Photo No. 3.—Built 46 years ago by G. H. Warren, of Chesterfield, this triple-expansion engine has cylinders ⅜ in., 1 in., and 1½ in. bore by 1½ in. stroke. Note the I.P. valve-chest at back, with valve driven by rocker-gear from eccentric on end of crankshaft

An interesting locomotive exhibit was a 4-2-2 locomotive lent by Mr. F. Cook, of Leeds, and labelled "Model Engineering as it was 40-50 years ago." It had a polished brass boiler and was, presumably, spirit-fired, though no burner was visible.

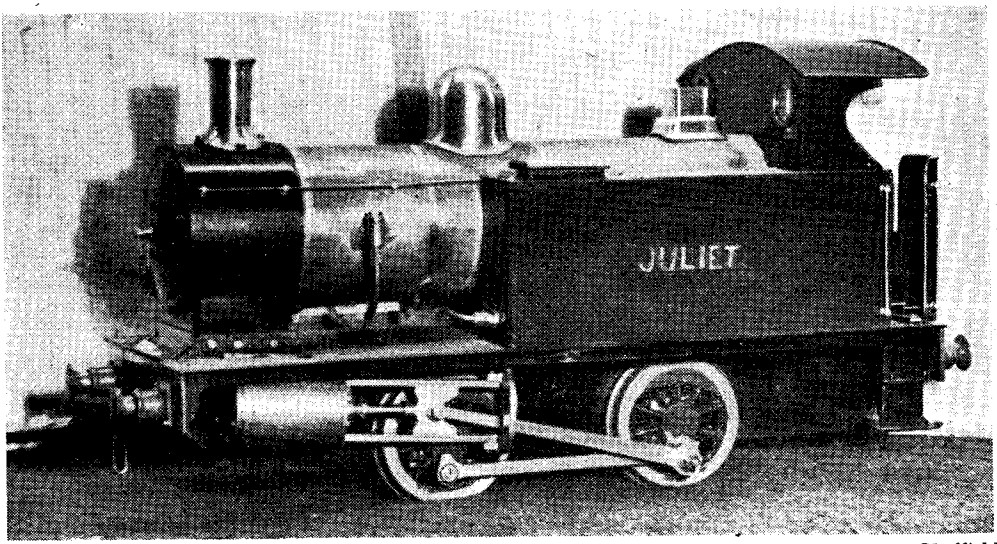


Photo by [*Press Photo Agency, Sheffield*

Photo No. 4.—"Juliet," "L.B.S.C.'s" ¾-in. scale four-wheeler, built by A. H. Kay, of Chesterfield

In a different category were the beautiful scale " O "-gauge locomotives of Mr. G. Drummond Lyell's Ashdown Forest Railway, and the " O "-gauge *Rocket*, 4-6-0 Jones Goods, G.N. Single, and Caledonian 4-2-2 of Mr. C. W. Meredith. Two other famous names in railway modelling are Theo. Pearson and Boyd Carpenter, the former exhibiting a " OO "-gauge L.M.S. compound, too, was proving her worth. Running on alternate days with this engine was Mr. R. Kerry's inch-scale tank (to L.M.S. outline), which had been in steam for seven hours on the previous day.

The stand of the Clay Cross Co. Ltd. carried two full-sized exhibits of great interest to model engineers. The first was a single-cylinder steam engine which was built by Stephenson himself.

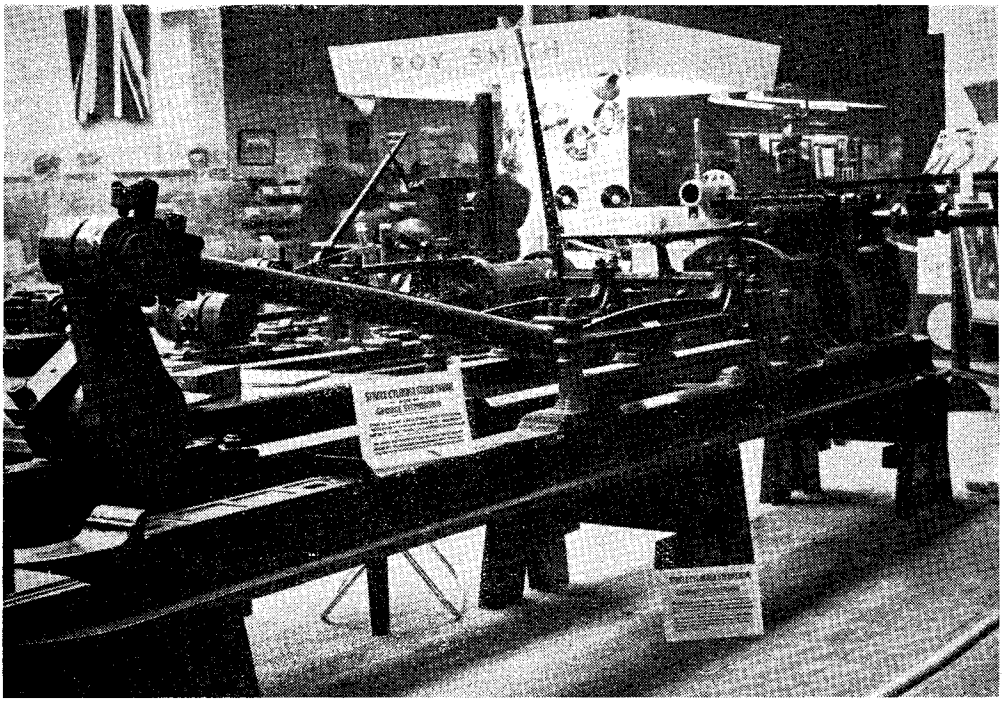


Photo by] [*Press Photo Agency, Sheffield*

Photo No. 5.—Over a century old, and still in working order. An engine built by George Stephenson which worked until 1946. *Note hand-operated slide-valve. The other main crankshaft bearing, not shown, was on an " outrigger " pedestal*

and the latter some lovely " O "-gauge rolling-stock.

Well known to MODEL ENGINEER readers are Mr. A. W. G. Tucker's " Lady Anna " and Mr. W. T. W. Rolls' " Rolls Scot," both of which have won high awards at the Horticultural Hall in former years.

The passenger-carrying track was situated in another room, but may be described here. There were actually two tracks, side by side, one from Worthing and the other from Sheffield S.M.E.E. On the former was Mr. Austen-Walton's " Centaur," recently fully described by him in MODEL ENGINEER pages. She was a treat to watch and to hear, and her genial owner-driver is to be congratulated on building a locomotive which does the job for which she was designed, and no error !

On the other track was Mr. N. E. Nicholson's ¾-in. scale " Princess Royal," which was fully described in THE MODEL ENGINEER in August, 1947. Driven by his son Raymond (who appeared to be enjoying himself hugely), this locomotive, Shown in Photograph No. 5, it is of 12-in. bore by 30-in. stroke, with a hand-operated slide-valve. The flywheel (not shown) is 12 ft. in diameter. The engine itself was in daily use from 1841 to 1946 at the Ambergate Lime Works of the company.

The second engine was the *first stationary engine ever to be fitted with link-motion.* Built at Burton-on-Trent Ironworks in 1847, the link-motion was installed in the following year, and the engine worked continuously from 1847 to 1934 at the Clay Cross No. 2 pit.

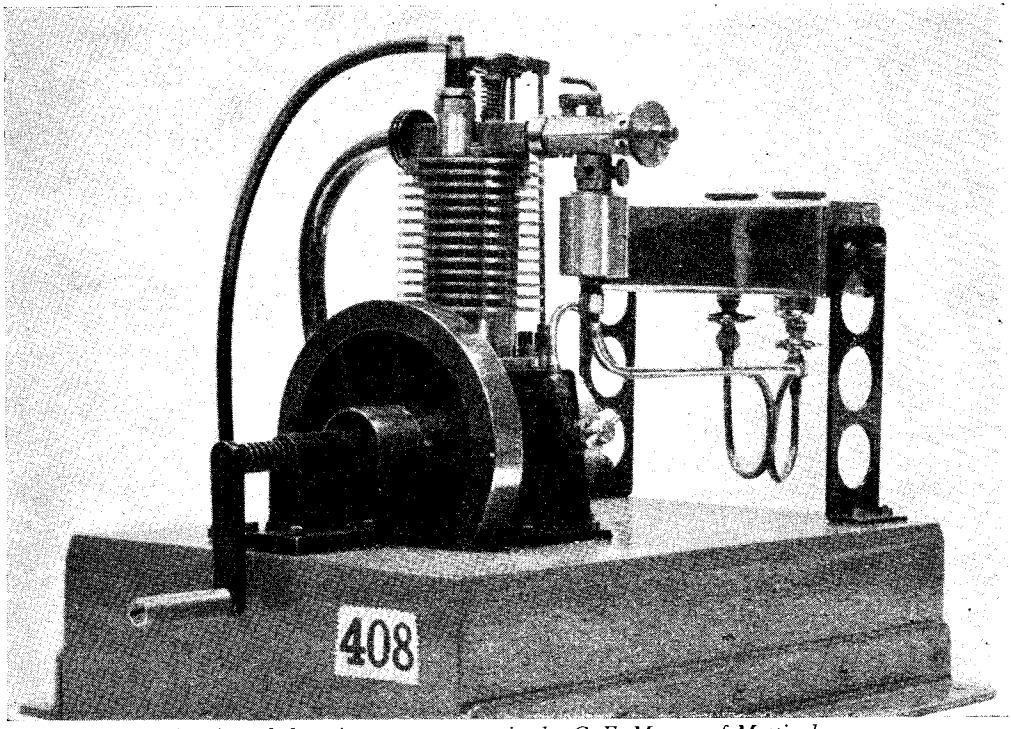
At the time of writing, I am seeking further particulars of these two engines, and with the Editor's permission, I hope to describe them more fully later. This also applies to another full-sized historical exhibit on the stand of the Sheepbridge Coal & Iron Co. Ltd. This engine is believed to have been built by Maudslay, Sons and Field some time between 1825 and 1850 and is still in perfect working order, though it was " retired " in 1946.

(To be continued)

*The Exhibition Internal Combustion Engines

by Edgar T. Westbury

THE stationary engine by C. E. Mercer, of Mottingham, S.E.9, is interesting, chiefly as an exercise in sound straightforward workmanship, as the design of the engine does not incorporate any very distinctive features or high suitability for the purpose to which it has been adapted. Fabricated construction is extensively used on the engine, and the workmanship is well carried out. It will probably work quite well, though the absence of any provision for forced cooling of the engine would limit its performance, and if the engine is really intended to work continuously, this would appear to be a regrettable omission.



An air-cooled stationary 15-c.c. engine by C. E. Mercer, of Mottingham

Of the other models entered specifically in the internal combustion engine section, mention may be made of the 15-c.c. engine by R. Simpson, of Bristol, No. 202, and the 25-c.c. 4-stroke i.c. engine by C. F. Toms, of Bristol, No. 203. The former engine appears to have been built mainly from the solid. The general design, at least in respect of the upper part of the engine, follows very closely the design of the Kiwi 15-c.c. engine, including the arrangements of valves, push rods, rockers and tappets. It was also fitted with a Kiwi type float-feed barrel-throttle carburettor. In the lower part of the engine, the resemblance was not quite so obvious, though it apparently had the same type of timing gear as the Kiwi, and also the same type of contact-breaker. One criticism of the crankcase design, however, is that the bolts securing the two halves of the crankcase together apparently passed through the thickness of the wall, no lugs having been formed on the outside of the case. Thus, there was a considerable amount of superfluous material, which possibly may not matter if the engine is not required for any purpose demanding economy of weight, but at the same time, general proportion and appearance would have been much improved by shaping the outside of the crankcase to form lugs. In other respects, this engine was quite a good piéce of workmanship.

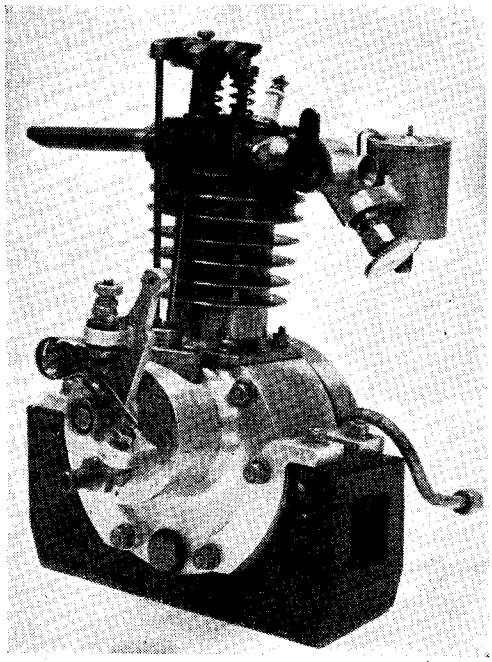
The 25-c.c. engine by C. F. Toms was an example of a fairly well-known commercial design, and appears to be carried out quite satisfactorily.

The carburettor fitted on this engine was an

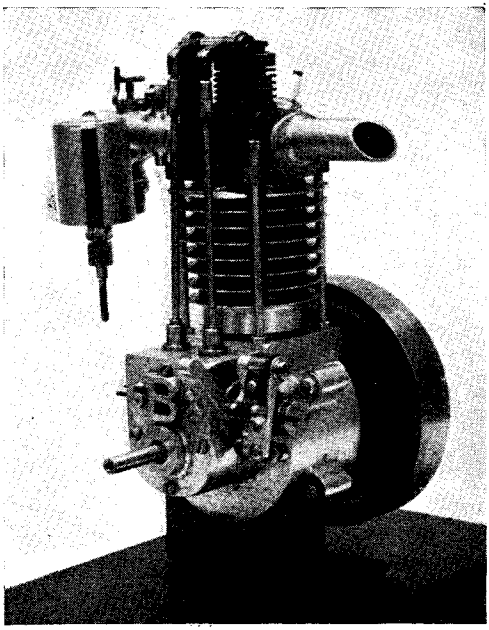
*Continued from page 268, " M.E.," September 9, 1948.

example of the " Atom " type R float-feed compensated jet type.

Examples of small compression-ignition engines were exhibited by G. S. Foster, of Morden, No. 198, H. E. S. Chase, of W. Croydon, No. 192,



Mr. R. Simpson's 15-c.c. o.h.v. petrol engine

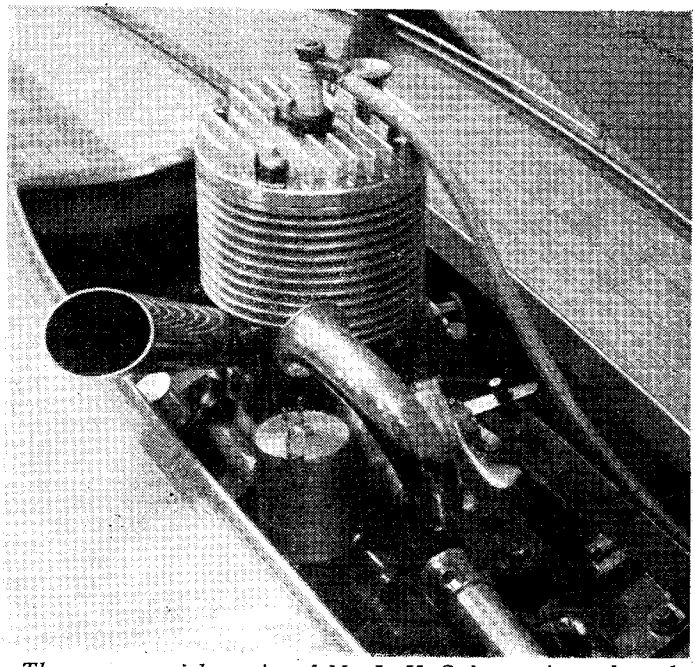


A 25-c.c. Bond's "Simplex" type engine, with "Atom" Type R carburettor, by C. F. Toms, of Bristol

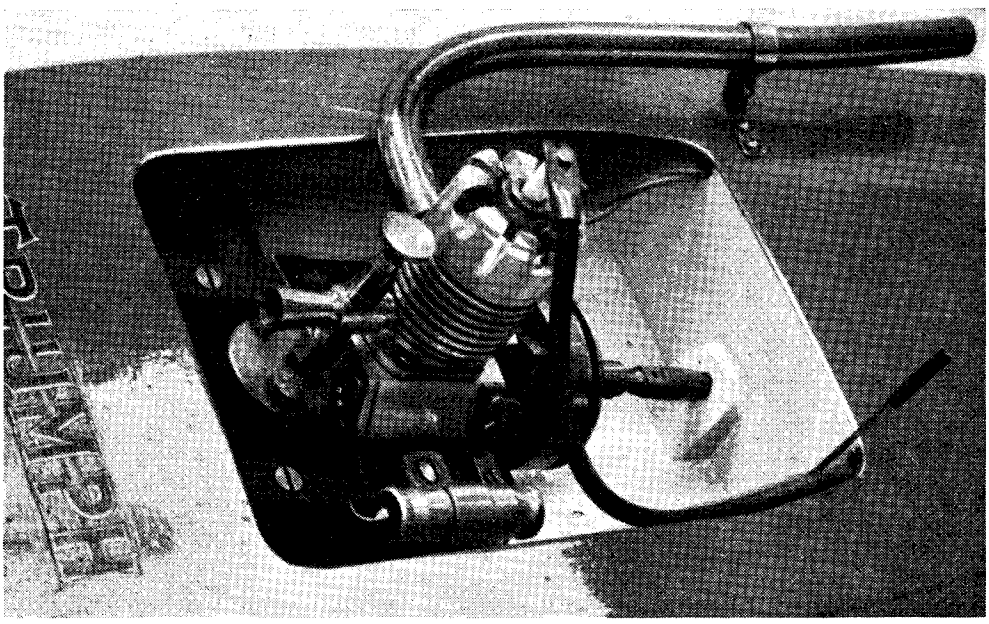
and H. F. Burbage, of London, W.4, No. 191. These were fairly typical of their particular class, but do not embody any very distinctive individual features. This particular type of engine is one of the most difficult to judge from external appearances, as little clue can be obtained as to their internal workmanship or working success, but so far as can be ascertained, the examples exhibited would appear to be quite successful engines.

Engines in Marine Craft

Several very interesting engines were to be seen in power boats of various types. The most striking engine in this section was the 2-stroke fitted to the experimental hydroplane *Atomic III* by L. V. See, of Portsmouth, No. 148. This engine was one of the largest I have seen fitted



The 75-c.c. 2-stroke engine of Mr. L. V. See's experimental speed boat "Atomic III"

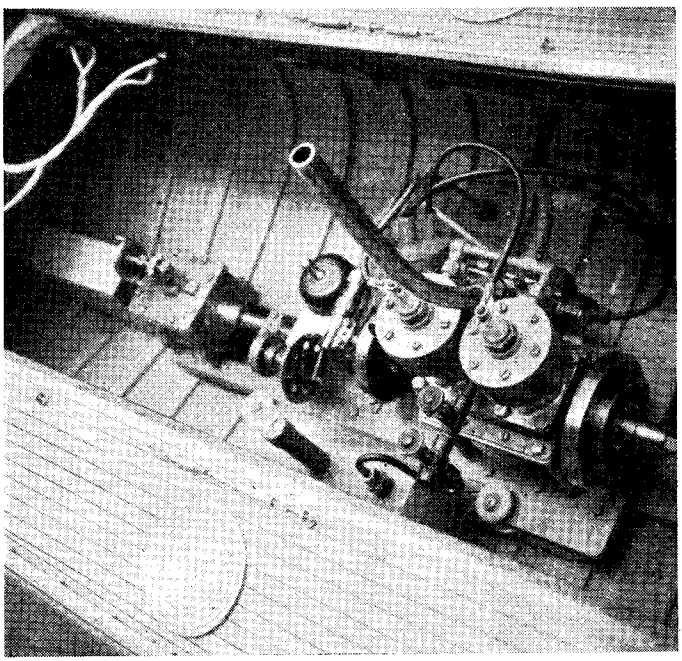


The engine of Mr. D. Stanford's model hydroplane

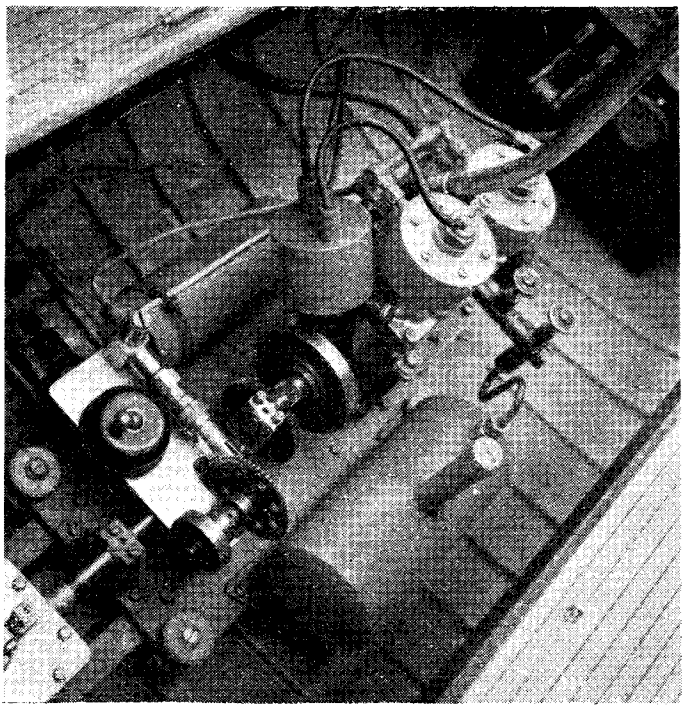
to a model power boat, but the boat which it propels is somewhat outsize compared with most boats of this type. I understand that the capacity of the engine was 75-c.c. Both the workmanship and finish of the engine were highly commendable, and although the fitting of such an engine to a really fine example of hull design and construction has been criticised, it was justifiable in view of the fact that the craft was definitely experimental. The engine was fitted with a barrel-throttle float-feed carburettor, and ignition was by a non-trembler coil and miniature accumulator.

The 30-c.c. engine fitted to the hydroplane by R. J. Harrison, of Tunbridge Wells, No. 143, was of a type which has been fairly popular and successful in the past, and the execution was workmanlike, but with no very distinguishing features.

Much the same may be said of the 2-stroke engine fitted to the hydroplane by D. Stanford of Tunbridge Wells, No. 149, but a word of criticism is called for here, in the way the constructor has done his best to make the



The engine of Dr. Fletcher's pilot boat "Vigilant," viewed from the forward end



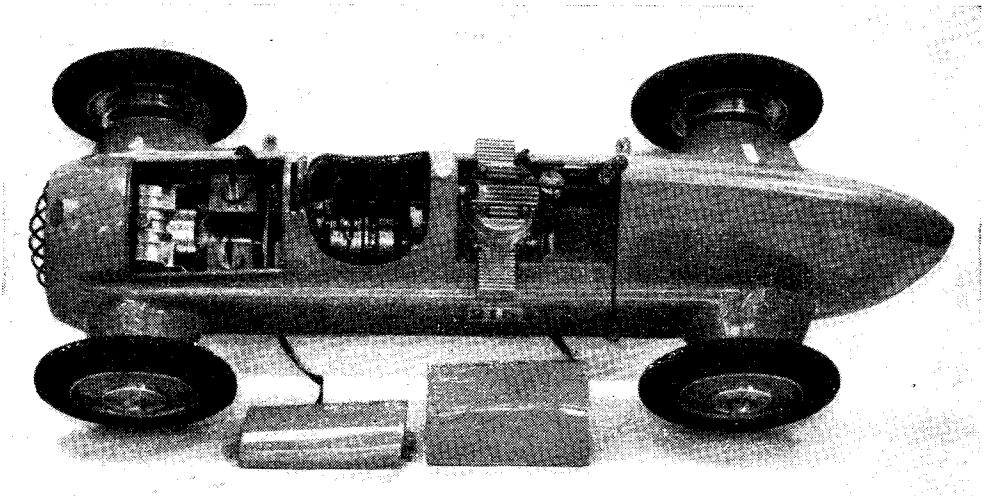
Another view of the pilot boat engine, from the after end of boat

cylinder-head of the engine look like a castellated nut.

One of the most interesting power plants I have ever seen in a model boat was the twin-cylinder 2-stroke engine fitted to Dr. T. Fletcher's River Pilot boat, No. 92. Although this engine was not built to resemble a prototype marine power plant, it was undoubtedly very well suited for the particular duty to which it was applied, and both the design and workmanship were extremely practical. The engine was equipped with a suction carburettor and geared high-tension distributor, and a gear-driven plunger pump was fitted for circulating cooling water. A reversing clutch was fitted to the propeller shaft, and engine room equipment also included a switchboard controlling lighting circuits throughout the boat. It may be remembered that Dr. Fletcher was responsible for the very remarkable seven-cylinder radial engine exhibited at the 1946 "M.E." Exhibition.

Model Racing Car Engines

Although the model racing cars will be dealt with in a separate review in *The Model Car News*, some mention here may be made of the engines fitted to cars in this section. There is little question that the outstanding example in this class was the "Ensign" engine of Mr. F. G. Boler's "M.C.N." Special racing car, No. 215. This engine has already been illustrated on the cover of the June 10th

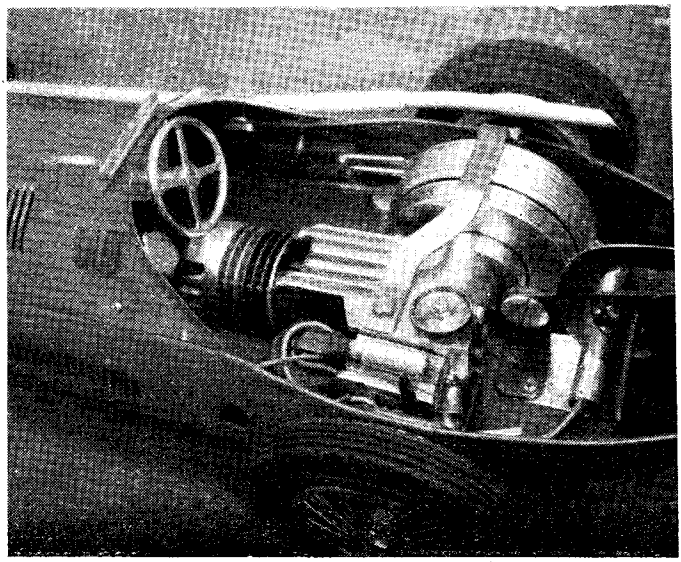


The "M.C.N." Special model racing car by Mr. F. Boler, with casings removed to show "Ensign" engine and transmission gearing

issue of THE MODEL ENGINEER, but a further illustration is given here of the complete car, with the engine fitted, and casings removed to show the internal fittings. It will be evident from this that the whole of the mechanical layout, also the chassis and body work were of a very high standard of workmanship and finish.

The "M.C.N." Special racing car by D. G. Cash, of Brighton, No. 219, was also fitted with an "Ensign" engine, and yet another of these engines was fitted to the car by K. W. Scott, of Sheffield, No. 221.

An engine which rates very highly from the aspect of design and was also very well executed, was that fitted to the model Alfa-Romeo racing car, by H. C. Wainwright, of Leicester, No. 222. This engine was arranged horizontally, with the cylinder facing forward, and drives one of the rear wheels through a spur reduction gearing and a centrifugal clutch. A rotary admission valve, presumably of the disc type, was fitted to the engine, and also an M.I. miniature magneto.

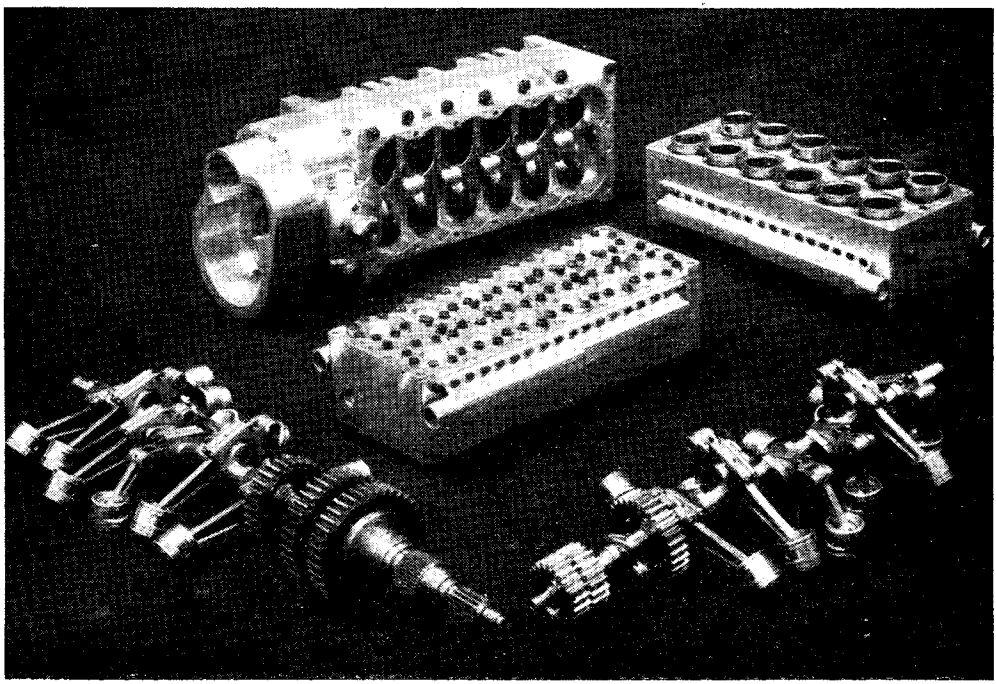


The power unit of Mr. H. C. Wainwright's model Alfa-Romeo racing car

Loan Models

The most remarkable exhibit in this class was the group of components for a Napier H-type 24-cylinder sleeve-valve aircraft engine,

(*Continued on page* 325)



Components of a model Napier H-type aircraft engine in course of construction, by Mr. S. H. Field

Our Swedish Visitors

Mr. Fjellstrom demonstrates his 0.04-c.c. diesel engine

THERE could be no better introduction to this subject than the speech made at the opening of THE MODEL ENGINEER Exhibition by Mr. Arvid Ohlin, who with his wife, accompanied Mr. Olle Edner, the managing editor of *Teknik for Alla*, on a visit to the exhibition. Mr. Ohlin, besides being a regular reader of THE MODEL ENGINEER and a builder of model locomotives, is one of the principal clothing manufacturers in Sweden. Here is his speech :—

" Ladies and Gentlemen, may I say how very glad I am to have the honour and privilege of representing Sweden in this, the twenty-third MODEL ENGINEER Exhibition, and the first international one. We come to meet you as in the Olympic Games, in a spirit of friendly rivalry, in order to measure our strength against that of other nations and, above all, to learn from them.

" We feel that in Sweden we may perhaps have a talent for craftsmanship, but the idea of the hobby, like that of modern sport, comes from England.

" You call her ' Old England,' personally I should prefer to say ' Young England.' You have a natural aptitude for play, even when you are old, which I regret to say we Swedes do not possess.

" It is by play that you refresh yourselves for your daily work, and even more important, that you prepare yourselves to face times of difficulty and unrest. The ability to relax begins in the hobby, and has spread to model engineering.

" We are, therefore, all the more glad to take part in this year's exhibition. We are grateful for the opportunity of meeting engineers and experts in producing tools and accessories.

" It is with deep regret that we meet today without Mr. Percival Marshall. His interest in this work never failed, and his energy was untiring. His spirit is still living, and will, I trust, remain with us. Let us go forward with his ideal, an ideal which, like that of sport, transcends social, financial or professional barriers and concentrates solely upon individual ability."

It is clear that Mr. Ohlin has the true model engineering spirit, and his own mental and physical alertness, together with his friendly disposition exemplify the views expressed in his speech.

All our overseas visitors spoke of their pleasure and astonishment at the high standard and variety of talent represented at the exhibition, and they will, I am sure, carry back to their own countries a high opinion of British craftsmanship and renewed enthusiasm to extend the hobby among their friends at home.

Also in the Swedish party was Mr. Fjellstrom and his wife. To him we are grateful for the opportunity of seeing his diesel engines, the smallest of which has a capacity of only 0.04 cubic centimetres and runs so smoothly and quietly that amidst the general noise of an exhibition hall it is necessary to hold it quite close to one's ear in order to hear it running.

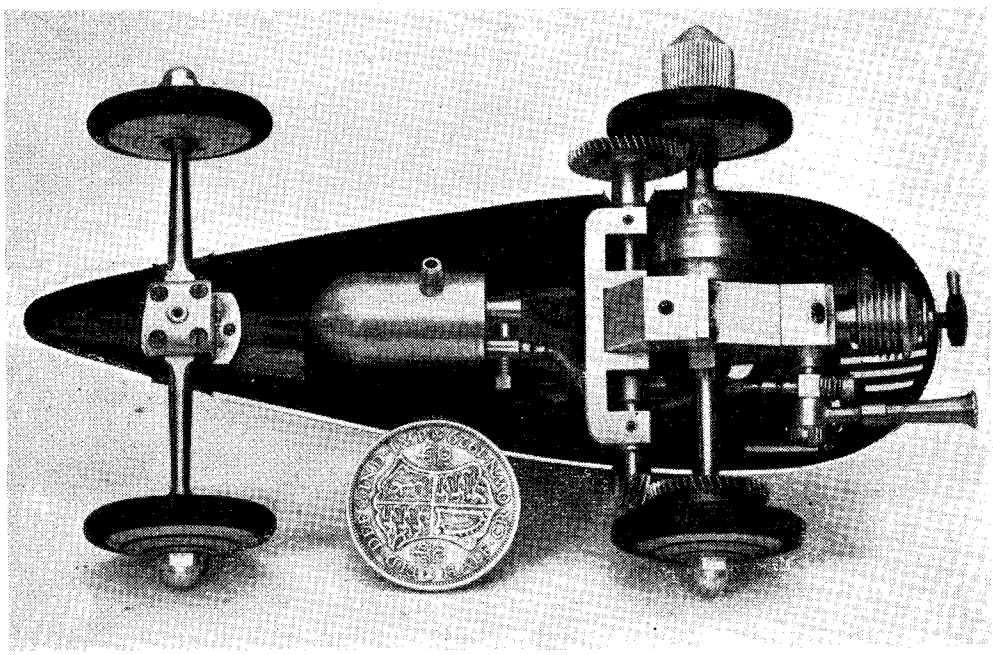
Our picture shows a Royal Marine listening for the sound of the engine whilst Mr. Fjellstrom adjusts the compression ratio.

Mr. Fjellstrom, who is a technician in the Swedish Air Force, also brought with him what is probably the smallest i.c.e. powered car in the world, which besides being a remarkable piece of precision engineering is driven by a diesel engine of 0.25-c.c. capacity, driving the front wheels through double helical reduction gearing.

At various times during the exhibition, Mr. Fjellstrom demonstrated this minute car in the area enclosed by the circular track, and I was impressed by its steady running and the ease with which it could be started.

Through these columns I would like to thank all model engineers overseas who, by sending their models to the exhibition made possible a representative international section never before achieved in the history of model engineering. I would also thank our Swedish visitors for coming to demonstrate their models and for the pleasure found in meeting them. They have, I am sure, established many friendships with British model-makers which will, it is hoped, be renewed with each succeeding exhibition.

And so, model engineering has proved again that although differences of language and distance separate us, fundamentally our interests are identical, and the development of a common hobby has provided the bridge which spans the gulf.—P.D.



Mr. Fjellstrom's car with cowling removed to show the mechanism

Exhibition Internal Combustion Engines

(*Continued from page* 323)

constructed by S. H. Field, of Godalming, No. 503. This engine was certainly one of the most ambitious that has ever been attempted in so small a size, and probably has a greater number of cylinders than any model yet constructed. I look forward to seeing this model when it is completed, and I hope it will attain the success as a working model which it deserves. Another very fine model in this section, also unfinished, was the model lorry chassis by L. O. Gibbs, of Addiscombe, which had a working 4-cylinder petrol engine of approximately 40-c.c. and was also fitted with a complete working 4-speed gearbox. The success of this model as a working proposition has already been demonstrated, and an article on the construction of the model appeared in the June issue of *The Model Car News*, 1948.

In the International section, the group of miniature compression-ignition engines by Mr. Fjellstrom, of Sweden, including two working examples which must rank among the smallest in the world, a complete engine-driven car which claims a similar distinction, and a larger engine in section, deserve high praise for workmanship and finish.

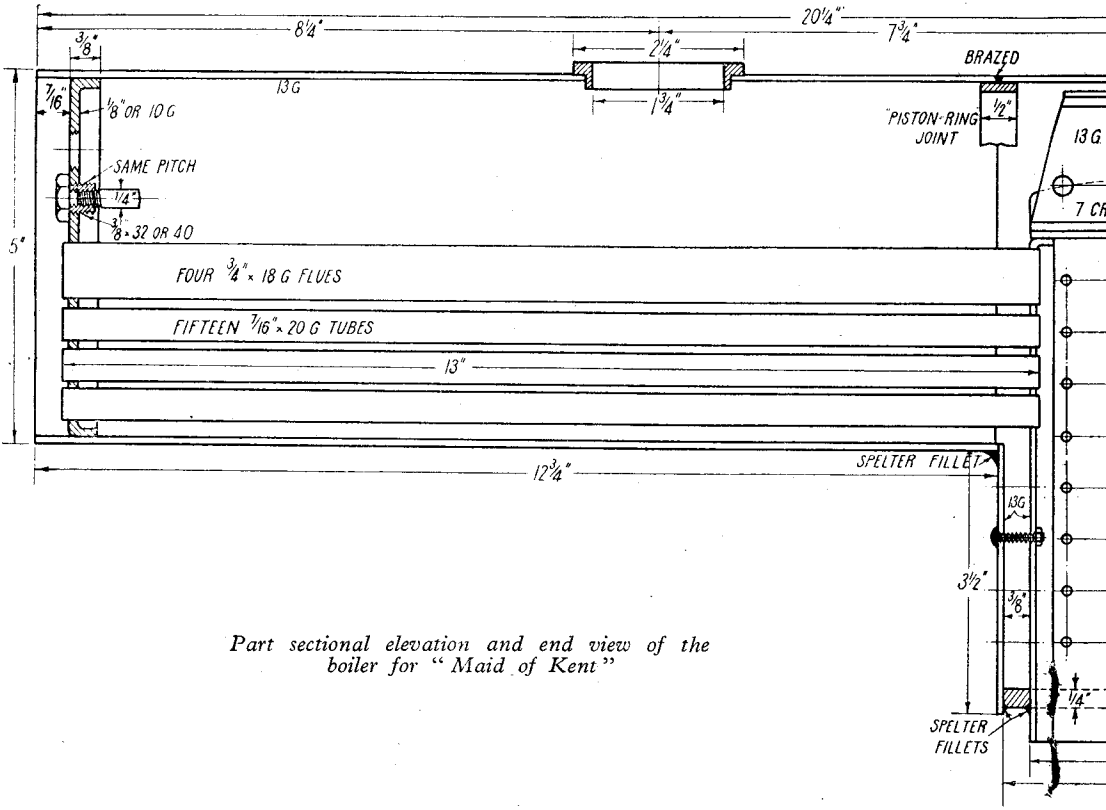
Boiler for the "M

by "L.B.

IT was your humble servant's original intention to make the boilers for "Maid of Kent" and "Minx" as nearly alike as possible, so that one lot of instructions and drawings would serve for both. This has panned out all right as far as the "words and music" are concerned, but I find that, owing to the difference in the coupled wheelbases and the size of the wheels, there will have to be some variation in the depth of the firebox. On the "Maid" it goes right down between the coupled wheels, same as big sister, as you can see from the reproduced drawing.

On the "Minx" the trailing axle gets in the way, so the box will have to be made shallower. To counteract this, as the engine has plenty of overhang at the trailing end, and a big cab, I have extended the firebox back into the cab, making the bottom of it *a la* Great Western; so what we lose on the swings, we shall gain on the roundabouts. "Minx" builders won't have to wait for their drawing until I have dealt with the "Maid's" boiler, as—all being well—it will appear next week. Then builders of both engines can get busy on the same instructions for the boilersmithing job. The barrels, smokebox and upper part of firebox tubeplates, tubes, superheater, fittings and so on and so forth are the same on both engines; it is only the length and depth of the fireboxes that vary. Also, you can use either Belpaire or round top, just as you please. The "Maid" (Southern L1) in full size has a Belpaire firebox, whilst the "Minx's" big sisters have round backs. Personally, I think the "Minx" would look jolly fine with a Belpaire firebox, like the Lawson Billinton K class on the old "Brighton" line.

The boilers look pretty small when compared with some of the huge unwieldy kettles seen on 5-in. gauge locomotives running on various club tracks; but you can take old Curly's word for it, that you'll get all the steam you require for anything within the power of the cylinders. As I've mentioned before, it isn't so much the *size*, but the *temperature* of the boiler that does the trick; and the experience I have personally had in boilersmithing has given me a good idea of how the heating surface should be proportioned to the size of the boiler to maintain that temperature. That is why "Jeanie Deans" keeps on blowing off, yet no sound comes from her chimney! The advantage of the small boiler, from the average builder's point of view, is that it doesn't need such a terrible lot of heat to braze it up. A five-pint paraffin blowlamp, or the equivalent air-gas blowpipe (fan or bellows-operated) will provide all the "therms" needed, with coke or breeze

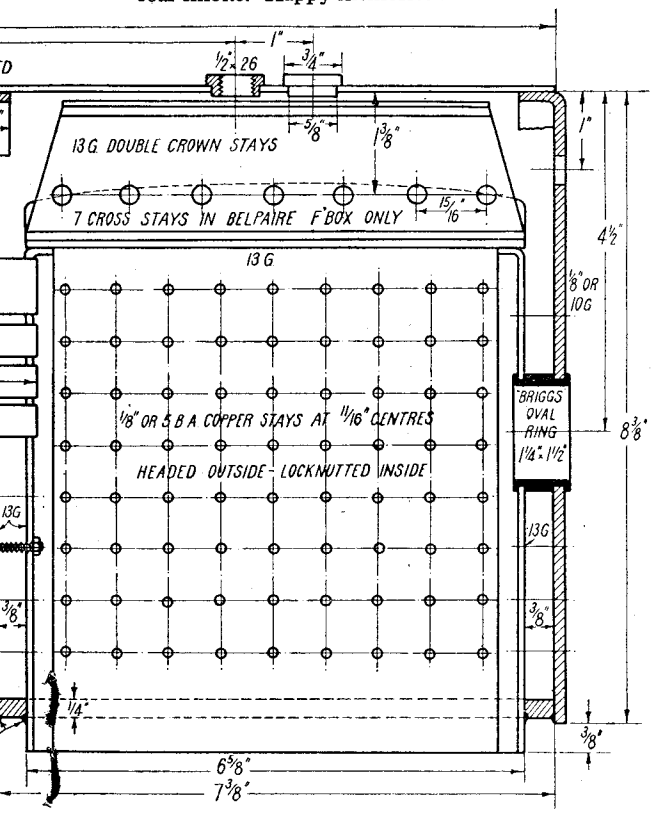


Part sectional elevation and end view of the boiler for "Maid of Kent"

"Maid of Kent"

"L.B.S.C."

packing; whilst an oxy-acetylene blowpipe renders the whole job a piece of cake. Putting the 160 odd stays in the firebox may prove a bit monotonous, but everything comes to an end at last. When I did "Grosvenor's" boiler-staying, my mind was away on big sister's footplate, buzzing along through beautiful Surrey and Sussex, listening to the click of the wheels and the hum of the motion, and sniffing hot oil and coal smoke. Happy memories!

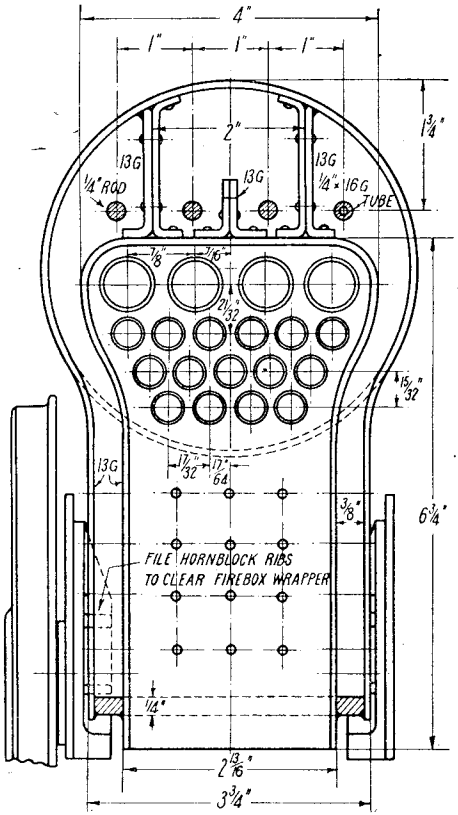


Barrel and Wrapper

Well, to get down to actual construction; I have fully described the various operations necessary to build a boiler, stage by stage, so many times that it is hardly necessary to wade through the whole complete ritual again. As there are some detail drawings to reproduce and space is somewhat limited by the unfortunately small pages of this journal, due to paper restrictions (that last word is high in my list of hated "detestables"!), I'll try to compromise, so that beginners and inexperienced workers won't be "left in the cold"—I'll say they won't, literally, when the five-pint lamp gets really busy!—and then I hope we shall all be happy.

For the barrel of the Belpaire boiler, or a two-piece round-backed boiler, you'll need a piece of 5-in. diameter, 13-gauge seamless copper tube, to finish to a length of 12¾ in. For the former, square off both ends in the lathe; for the latter, bevel off the rear end as well. On the average small lathe, the best way to turn it is to drive a piece of wood into each end, centre, and run between centres, putting on the faceplate instead of the catchplate, and putting a woodscrew into one of the end plugs, so that it sticks out far enough to engage one of the faceplate slots, thus ensuring a positive drive. Of course, if you have a 5-in. chuck, or larger, hold the driving end in that.

Failing a piece of tube, the Belpaire barrel can be made from a piece of 13-gauge sheet copper



16¼ in. long and 12¾ in. wide, rolled into a tube with ½ in. lap joint. Put about a dozen 3/32-in. copper rivets through the lap, to hold it whilst being brazed. For a round-backed boiler, don't make a separate barrel; make the barrel and wrapper all in one piece. This will need a sheet of copper 20½ in. by 20¼ in. On each shorter side, make a cut 7½ in. from one end, 5 in. deep; then reduce the width of the longer end to 16¼ in. Bend that part into a circle, and rivet as above; bend the other end to the shape of the firebox wrapper. The gap between the sides of the wrapper and the underside of the barrel can be filled in with a piece of 13-gauge copper flanged over for ⅜ in. each side, these flanges being riveted to the

wrapper ; the upper edge is cut to the curve of the barrel, and butted up against the end of same. There isn't the slightest need to flange out the curve to rivet to the barrel ; in this particular location, the pressure only tends to force the flat plate into closer contact with the end of the barrel, and a fillet of spelter or Sifbronze will render this joint as sound as any other in the whole boiler. Wait until you have made the backhead former before flanging the plate, as this job can be done over it.

For the two-piece boiler jobs (barrel and wrapper separate) first cut out a former, or flanging plate, from ¼-in. steel plate sawn and filed to outline ; not a hard job if plenty of cutting oil and a good saw is used, such as the " Eclipse " high-speed, Millers Falls " Bluemol," or similar good brand. The plate is cut to a dimension of ⅛ in. less all around, except at bottom, than the size of backhead required. The actual dimensions of the Belpaire backhead and throatplate are shown in the illustration ; the dimensions of the round-back ditto are taken from the inner wrapper line on the cross-section through firebox, as the backhead fits inside the wrapper. The pieces of copper sheet for the backhead and throatplate of the Belpaire wrapper are cut ½ in. bigger than the former all around except at bottom ; ditto the round-backed backhead, but the throatplate for the round-back is only 5 in. high, the upper edge being cut concave to suit the curve of the barrel, as mentioned above.

The process of flanging, I may remind beginners, merely consists in clamping the bit of copper alongside the former in the bench vice, and beating down the projecting ½ in. of copper over the edge of the former. As soon as it shows any signs of going hard, or buckling, anneal by heating to red and plunging into cold water, repeating the dose as necessary. Copper hardens rapidly when hammered.

How to Assemble the Two-piece Jobs

For the Belpaire, cut a hole 4 13/16 in. in the throatplate, either with a metal-piercing saw (glorified fretsaw) or by drilling holes all around, chopping the piece out and cleaning up with a file. Then bend a piece of 13-gauge sheet copper 22 in. long and 7½ in. wide, to the shape of the backhead and throatplate. When doing jobs like these, I just put a bar in the bench vice, with the end overhanging the desired amount, and bend the plate over it with my hands. It isn't quite such an effort as would appear at first sight, for the length of the plate gives ample leverage ; anyway, you try it and see how you make out. The bit of bar should be a little less in diameter than twice the radius of the corners, as the spring of the copper always ensures a radius greater than the bar over which you bend it. The reverse-bends halfway down are formed in similar manner over the bar, by a little careful manipulation. Rivet the throatplate inside the shaped wrapper, by a few 3/32-in. rivets through throatplate flange and edge of wrapper. Bend a ½-in. strip of 3/32-in. sheet copper into a ring that will fit inside the hole in throatplate, and put the barrel over it, the end of barrel butting up against the throatplate ; the ring forms a sort of spigot that keeps the barrel lined up with the hole.

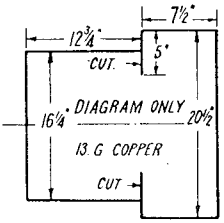
For the two-piece round-backed job, bend up a strip of copper into a ring as above, enter it into the bevelled-off end of the barrel for half its width, and secure it with a few rivets. Bend up the wrapper from a sheet of 3/32-in. or 13-gauge sheet copper 20½ in. by 7½ in., to the shape shown in the cross-section of boiler. Put the curved part of this over the ring projecting from the barrel, and fix it with a few more rivets. Where the wrapper sheet butts up against the barrel, the edge should be bevelled off. Fit the throatplate in underneath, as described above for the one-piece round-backed shell, and make sure it butts up tightly against the edge of barrel on the underside, in the manner illustrated.

The First Brazing Job

No beginner need be scared about tackling the brazing jobs. All you need are the materials, a little patience and perseverance, and a dickens of a lot of " therms." Any good easy-running brazing-strip will do ; but for " extra " easy-running, I recommend Johnson-Matthey's B-6 alloy, which is really a coarse grade of silver-solder, and therefore more expensive than the usual copper-zinc alloys. Used with either " Tenacity No. 1 " flux, or Boron compo, it certainly does the job. Same flux does for brazing strips, or granulated spelter. A discarded tray, or even an old dustbin lid, with three or four firebricks or fire-tiles around the back of it, to prevent the coke or breeze falling overboard, makes a nobby brazing pan or forge, propped up on a few bricks, or mounted on an iron stand. A hefty pair of tongs to lift the hot boiler and a small pair for holding bits of brazing strip are needed ; the latter can be home-made from ⅜-in. by ⅛-in. steel. A " scratching-wire " can be made from a couple of feet of 3/16-in. iron rod, bent to a ring at one end and filed to a point at the other. For a pickle-tank, I lined an old wooden box, big enough to hold my boilers, with sheet lead, folding over the corners, same as we did when making paper boxes in childhood days. The wooden box rotted away long since, but the lead has remained. The pickle is a mixture of one part commercial sulphuric acid, to about 16 or so of water. *Add the acid to the water.*

The job is simple enough, in all conscience ; and if I briefly describe it, this will serve for practically every joint in the boiler, the *modus operandi* being the same. First mix up some of the flux to a creamy paste with water, and well cover all the joints to be brazed. Then stand the boiler shell in the pan or tray, with the barrel pointing skywards. Pile small coke or blacksmith's breeze all around the outside, to within ¼ in. or so of the throatplate ; inside the firebox shell, to a slightly less height. The firebricks or fire-tiles should, of course, be on the side of the pan or tray farthest from you, and the open part of the firebox toward you. Have a lid handy, with some dry flux in it. Get the blowlamp or blowpipe going good and strong, and heat up the whole of the wrapper which shows above the coke, and also the throatplate and adjacent part of the barrel, to a dull red. By the time the red appears, the coke or breeze should be glowing also, and will help the job a whole heap. When the whole is evenly heated, concentrate the flame on one bottom corner of

the throatplate ; and when that glows bright red, dip the end of the piece of brazing-strip in the dry flux, and apply it to the joint, in the flame. If you warm the strip in the flame before dipping it in the dry flux, the latter will stick to it. If the copper is hot enough, the brazing-strip will instantly melt and flow into the joint, penetrating the full depth of the flange. Now this is the " secret," if it can be called such ; I don't claim



One-piece boiler shell " in the flat "

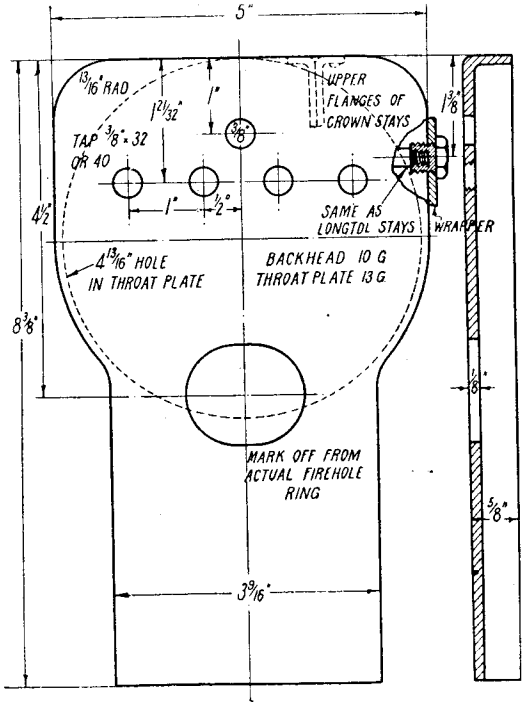
originality, any coppersmith who knows his job will know this. As soon as the brazing-strip has melted, run, and penetrated, move the flame slowly along, and direct it on that part of the joint just beyond the first " melt." When that reaches bright red, a few seconds later, apply the strip again, dipped in the dry flux as before. A little more will melt off and flow in the joint ; and the end of the first dose should not yet have solidified, being still in the blowlamp flame, so the two portions should join in an unbroken fillet. Then repeat operation a little farther along still, and ditto repeato until you have worked your way up to the joint between throatplate and barrel, and right around under the barrel. When you reach the other side of the throatplate, it makes an easier job if, instead of coming down, you restart from the bottom, work your way up, and when the two applications of brazing-strip meet, blow on the joint direct until they both meet and amalgamate. Sounds simple enough, doesn't it—and, believe me, it *is* as simple as it sounds.

Next, on the Belpaire boiler shell turn the whole issue around until the top of the wrapper is toward you ; then, starting from where the throatplate joins the barrel, where you left off the first instalment, work your way right around the barrel, and the joint between throatplate and wrapper. These two are heated at the same time, or " in the same breath," in a manner of speaking, and the brazing strip is applied to both joints alternately, as the flame of a five-pint lamp covers both at once.

If you are making a two-piece round-back with the piston-ring joint, when you have finished the first spasm described above, lay the boiler on its side, and blow direct on the vee-groove between barrel and wrapper, applying sufficient brazing material to fill the groove. See that the first application amalgamates with the spelter already in the joint where the barrel and throatplate meet ; then carry on right around, filling up the vee-groove until you reach the corresponding point on the other side of the shell. Don't stint the brazing material on this joint, let it have all the groove will hold, and a bit extra for luck. Any surplus left when cool is easily filed off flush with the barrel and wrapper. Turn the shell over to do the other side.

When the joints have been completely covered with the brazing material, let the job cool to black, then carefully put it in the pickle by aid of the big tongs. Let it stay in for about 15 to 20 minutes, then fish it out, and well wash in running water, finally cleaning it with a handful of steel wool, or domestic washing-powder applied with a discarded nailbrush or similar gadget. If there is any roughness, it can be filed off, but there won't be any if you have had sufficient heat to run the spelter. Heat, and plenty of it, is *the* essential to good brazed joints. Should there be any bubbling when the spelter is liquid, run the scratching wire around the part where the blowlamp flame is playing ; this will break up any blobs of flux that might form tiny bubbles in the finished joint, and eventually cause leakage.

If oxy-acetylene apparatus is available, use a much bigger tip or nozzle than recommended by the blowpipe makers for similar thickness of steel welding, and reduce the gas pressure, so that the flame does not hiss so much. Start from the bottom corner, as before, and blow up till the metal is bright red ; then hold a stick of Sifbronze



Backhead for Belpaire firebox

or similar bronze-welding rod in the flame, and let a blob melt off and drop right into the hot spot. This will run into the joint ; then move the flame along so that the next drop overlaps the first, and continue same way right around the whole issue. The finished joint should present a rippled appearance. Pickle, wash off, and clean up as above. Tip : always use the flux recom-

(*Continued on page* 333)

IN THE WORKSHOP

by "Duplex"

*20—Machine-tool Slide Gibs and Locking Devices

THE gib-piece of the form shown in the previous article is clearly secured firmly in place by means of its fixing-screws, but the gib-strip, as generally fitted, is constrained only by its pointed adjusting-screws which, moreover, meet the strip at an angle.

Now, the frictional contact between a gib-strip and its working surface on the opposing slide will tend to move the strip endways, so that it lags behind the movement of the slide to which it is attached; this movement will cause wear at the point where the adjusting-screw is in contact with the strip, and, in time, the slide will need readjustment to make good the wear that has taken place.

It is this factor, perhaps, which explains the complaints that the slides will not keep in adjustment, but the lack of lock-nuts on the adjusting-screws probably also plays a part, as the screws are rocked from side to side in conformity with the endways movement of the gib-strip. This trouble is, however, less likely to arise if the adjusting-screws are made a close fit in the slide, and the points of the screws are accurately seated in the strip.

On the other hand, long experience shows that, where the gib-strips are provided with some effective form of end location and constraint, the slides so fitted will remain in correct adjustment for very long periods.

In theory, meaning that this is the correct practice, the gib-strip should be constrained in an endwise direction only, leaving it otherwise free to align itself under the pressure exerted by the adjusting-screws.

The simplest and, perhaps, the most commonly used method of locating the strip is that illustrated in Fig. 6, where it will be seen that a parallel pin fixed in the slide engages a hole drilled in the strip. When fitting a register-pin in this way, the gib should be clamped to the outer member of the slide so that the hole can be drilled at the correct angle in the strip, and a reamer is then passed through the parts while still in position. The pin should be made a good fit in the slide, and its end is then stoned with an oil-stone slip while it is revolving in the

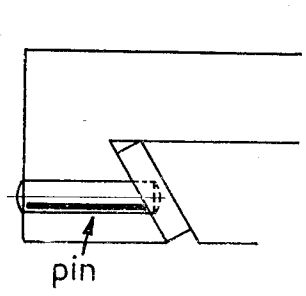
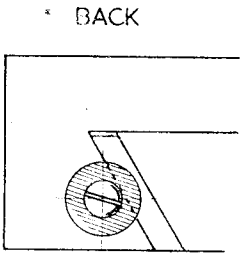
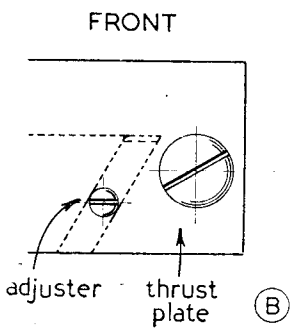


Fig. 6





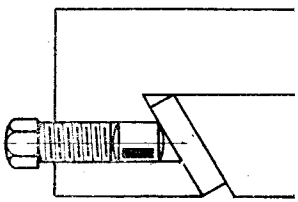
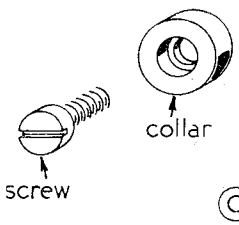


Fig. 8



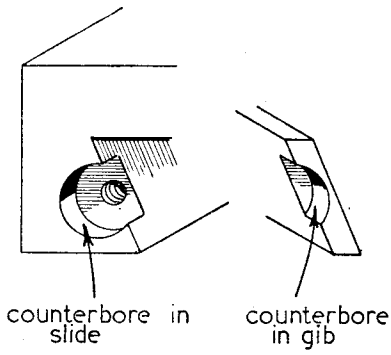


Fig. 7

*Continued from page 285, "M.E.," September 9, 1948.

drilling machine, in order to provide the necessary working clearance in the strip.

This method of pinning locates the strip in other directions in addition to the endwise constraint required, but the following arrangement, which was adopted by the writers in the case of the cross-slide of a Drummond lathe, provides for end location only.

The keep-plate of the cross-slide is next marked-out and drilled for the $\frac{3}{16}$ in. 40 t.p.i. grub-screw, which bears on the front end of the strip and affords it positive and exact end location.

Before this modification was made, it was found that the cross-slide needed rather frequent adjustment, but following the alteration, made

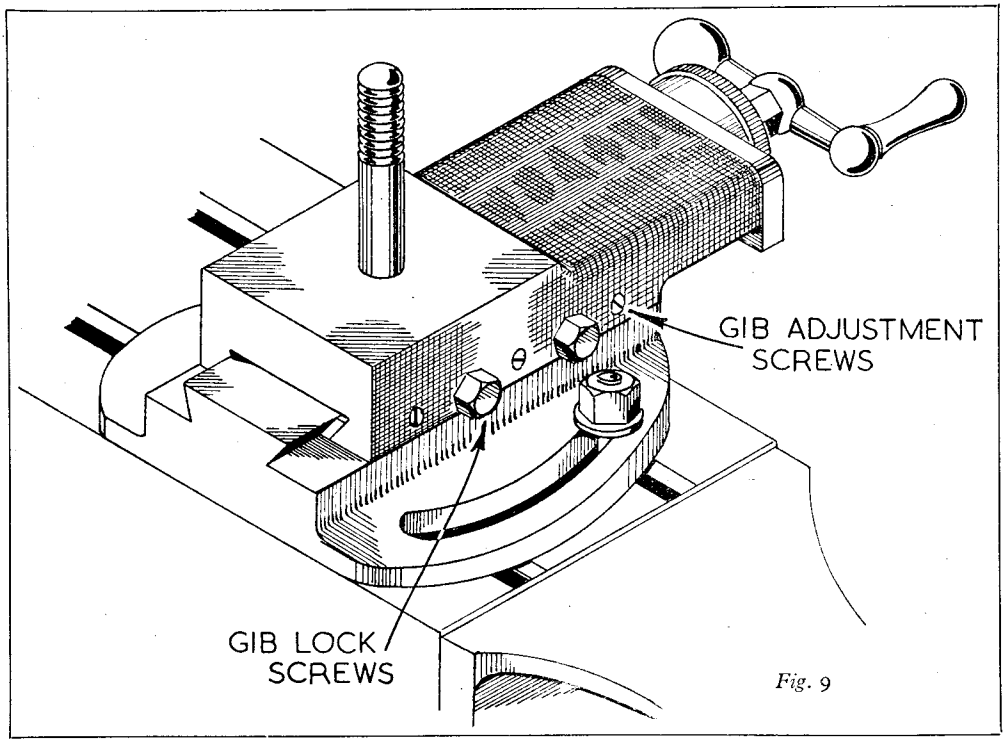


Fig. 9

Here, a collar, secured by a cheese-headed screw, is recessed into both the slide and the gib-strip at its rear end, as indicated in Fig. 7A. At the front end, the gib is located by means of a screw fitted to the keep-plate of the slide, as shown in Fig. 7B.

The machined component parts are illustrated in Fig. 7C.

To carry out the necessary machining, the slide, with the gib-strip clamped in place and located by its adjusting-screws, is secured to an angle plate mounted on the table of the drilling machine; an $\frac{1}{8}$ in. pilot hole is then drilled on the centre previously marked-out. A $\frac{3}{8}$ in. pin-drill with an $\frac{1}{8}$ in. pilot is used to form the recess in both the slide and the strip to receive the collar.

The collar is turned to fit this recess and is also counterbored for the head of the $\frac{3}{16}$ in. 40 t.p.i. screw to secure the part in position. Finally, when the work is assembled, the end of the slide is finished to a good appearance by cross-scraping and frosting, and a uniform surface is produced with only the screw slot visible.

a long while ago, the slide has not required attention.

Locking Machine Slides

The greatest rigidity in a machine slide is, of course, secured where it is locked with the pressure resisting faces in contact, that is to say when the parts of the slide which are cast integrally with it are held firmly together.

It is to gain rigidity, too, that some lathe users, when undertaking heavy turning operations prefer to remove the top slide and use instead a tool-post fixed directly to the cross-slide.

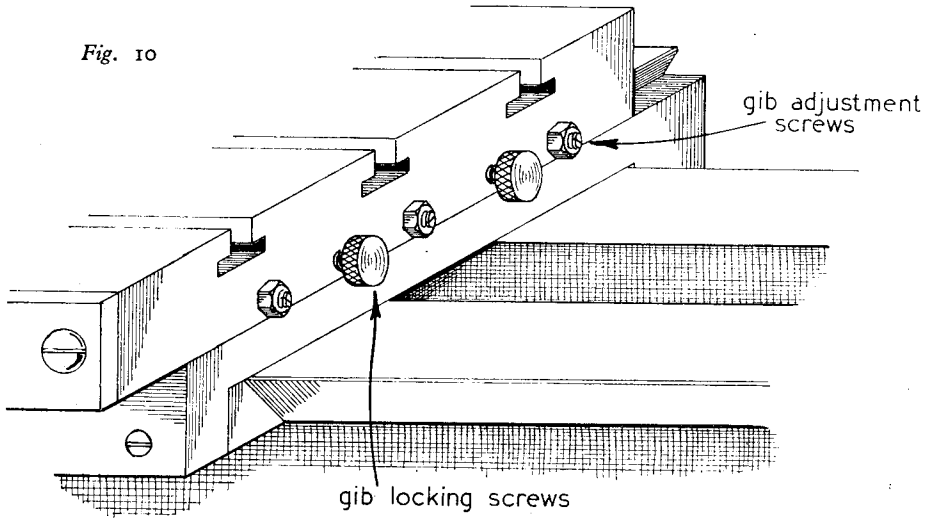
It is also a good practice, when milling and carrying out many other lathe operations, to lock all slides not actually in use. If, however, the only slide-locks available are the gib adjusting-screws, the operator may well hesitate before using these and having later to readjust the setting of the slides.

Where a gib-strip is used, screws should be fitted between the adjusting-screws as shown in Figs. 8, 9 and 10.

These screws, which may have either knurled or hexagon heads, are used to press a pad-piece

against the strip and so tighten the slide against its pressure or working face : but, if preferred, the strip can be drilled to allow the brass pads to press directly on the sliding surface. In either case the original adjustment of the slide will be restored when the locking-screws are slackened.

Fig. 10



Where, as shown in Fig. 11, a gib-piece is fitted, it must be cross-drilled to allow the pad-piece to press against the sliding surface, for in this case the adjustment of the slide would

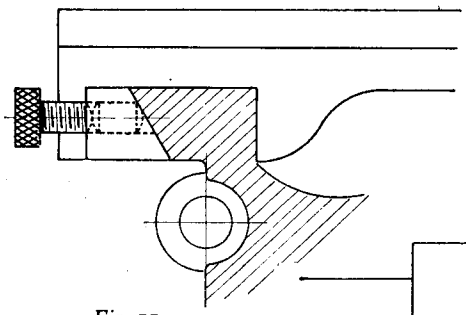


Fig. 11

be lost, and the purpose of the locking-screw defeated, if the gib-piece itself were moved.

The advantage of locking the saddle in this way is that it is then held firmly against its guide face on the bed, thus ensuring the accuracy of its position for facing work attached to the mandrel or to the boring table.

The devices described can be applied to the top-slide, the cross-slide, and the front slide of the saddle, as illustrated in the accompanying drawings, but it is more usual and generally preferable to lock the saddle against a rectangular slide such as is found at the rear of the bed in the Drummond type lathe.

In this lathe, as shown in Fig. 12, a tipping strip, attached to the underside of the saddle sole-plate, bears on the flat under surface of the rear bed-shear. To provide a saddle lock in a lathe of this make, the writers fitted two cross-handled screws to the tipping-strip : and to prevent damage to the bed surface, brass pad-pieces were interposed between the ends of the screws and the bed.

This construction has the advantage that the saddle is clamped to the bed in two places, also the clamping screws can be tightened with the fingers and no spanner is required ; moreover, the saddle is prevented twisting on the bed, as well as from moving along it.

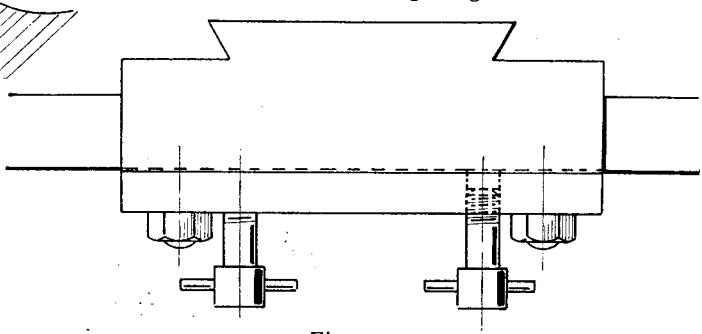


Fig. 12

The more usual method of locking the saddle is to use a single bolt to clamp a pressure plate against the under surface of the rectangular portion of the bed-shear, as represented in Fig. 13. It will, however, be appreciated that the locking

pressure is here applied at one point only, instead of being distributed as in the previous design : it follows, therefore, that if there is any play in the slides, the saddle will be able to twist on the bed with the clamp acting as a pivot.

sliding surfaces than the cutter can overcome.

Here again, the cross-slide friction-lock comes in useful and saves altering the permanent adjustment of the slide.

The friction-screws should be tightened in

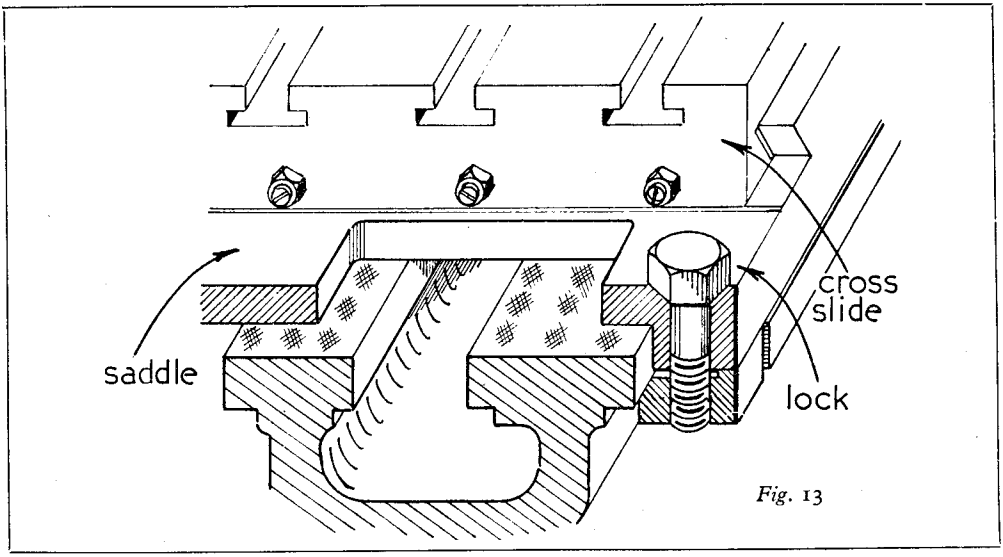


Fig. 13

Adjusting the Cross-Slide for Milling

As has already been mentioned, when the milling cutter or fly-cutter is set to machine the upper surface of the work, with the lathe running in the normal direction of rotation, there is a tendency for the cutter to grab and pull the work farther into cut. This may result in both the tool and the work being damaged : but it can usually be avoided by tightening the cross-slide to impose more friction on the turn with the fingers while the feed handle is rotated, and this is continued until the feed becomes rather stiff, and it is judged that sufficient friction has been established in the movement of the slide to resist any greediness or tendency to grab on the part of the cutter. It is important, too, when milling in this way, to reduce the backlash in the feed mechanism to a minimum, in order to restrict the amount the slide can be pulled towards the cutter.

"L.B.S.C."

(*Continued from page* 329)

mended by the makers of the welding-rod you are using, to ensure absolutely perfect joints.

If the barrel is rolled from sheet, with a lap seam, or the shell is made as a one-piece job, the lap seam may be brazed either before or after the throatplate-to-wrapper joints are done ; please yourselves. "Grosvenor's" boiler has a one-piece shell ; I did the lap seam first, in this case, then stood the shell up on end, did the left side of throatplate and half the throatplate-to-barrel joint, then the right side of throatplate, and the other half, giving an extra blow-up for luck at the "winning-post," I used my "Alda" oxy-acetylene blowpipe with the 300-litre tip, and Sifbronze rod and flux. The job came out perfect.

Another Friend Passes

May I add my little testimony to what has already been published about the late Mr. Douglas Picknell. I first made his acquaintance when he was building his 3½-in. gauge Southern 4-6-0 "Sir Launcelot," and corresponded frequently whilst he was busy on his super-detailed "Princess Marina," a beautiful piece of work if ever there was one. At the time of his untimely end—he was 58—he was building a 5-in. gauge Stirling G.N.R. 8-ft. single, which he intended to be about the last word, both for complete and accurate detail, and for steaming and pulling. I had already given him sizes of ports, valves and a recommended setting, and he was eagerly looking forward to breaking all records on the club's new line at Campbell Green. He was also a clever watchmaker, and I have a lasting record of his skill at the "weeny job," in the shape of the little green Waltham car clock, presented to me many years ago by Mr. Wilmot for "services rendered." "Bro. Doug" completely overhauled this quite recently, and fitted new springs. I don't use it on the gasoline cart, as she has a "built-in" clock ; the Waltham clock is mounted on a stand, and does duty in the room where I do my writing and drawing.

The world in general, and the Birmingham S.M.E. in particular, are all the poorer for the loss of a craftsman such as Doug Picknell.

The Guildford Regatta

ONE of the most successful regattas of the season was held on Sunday, August 15th, when the Guildford Model Yacht and Power Boat Club held their annual M.P.B.A. regatta.

The bad weather this season has hampered many regattas, and it was a change to see a fine day for the various boats to show their paces.

The regatta opened with a nomination event for prototype and free-running craft. This event showed well-known boats from the Blackheath, Victoria and Orpington Clubs in action, and all behaved very well.

The result of this nomination race was as follows :—

1st : Mr. J. Benson (Blackheath), *Comet*, error 0.3 sec.

2nd : Mr. J. Lines (Orpington), *Blitz*, error 0.5 sec.

The steering event came next, and the same boats ran again. The scoring was quite good, especially as there was a cross wind blowing. The winner of this competition was to hold the Guildford Steering Trophy for one year, and it again went to the Blackheath Club, this time the winner being Mr. A. Rayman, with *Yvonne*, who scored a bull and two inners ; Mr. Vanner, with *Leda III*, followed on with a bull, one inner and one miss.

Result

1st : Mr. A. Rayman (Blackheath), *Yvonne*, 7 points.

2nd : Mr. E. Vanner (Victoria), *Leda III*, 5 points.

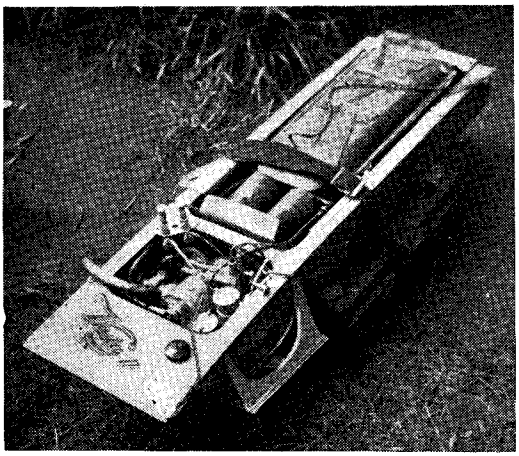
3rd : Mr. G. Lines (Orpington), *Blitz*, 4 points.

A short lunch interval followed and when this most important interlude was over, the programme continued with the speed events, and although the " B " and " C " class boats were in short supply, it was gratifying to see quite a strong gathering of the " A " class hydroplanes.

Of the smaller boats, the first boat on the line was a new craft, *Zephyr*, by Mr. Martin, of Southampton ; this boat contains the same plant as *Tornado III*, but differs from the former boat by having a surface propeller. This boat performed well and just managed to beat Mr. Cruickshank's *Defiant III* by a narrow margin.

Of the " B " class boats, Mr. F. Jutton's *Vesta II* was outstanding as usual, and completed at a speed approaching 40 m.p.h.

Mr. Rayman (Blackheath) starting " Yvonne " in the steering competition



Mr. Jutton's "Vesta" (Guildford); an easy winner in "B" class

Result of "C" Class Race (300 yds.)

1st: Mr. A. Martin (Southampton), *Zephyr*, 19.5 sec., 31.5 m.p.h.
2nd: Mr. J. Cruickshank (Victoria), *Defiant III*, 20.9 sec., 29.2 m.p.h.

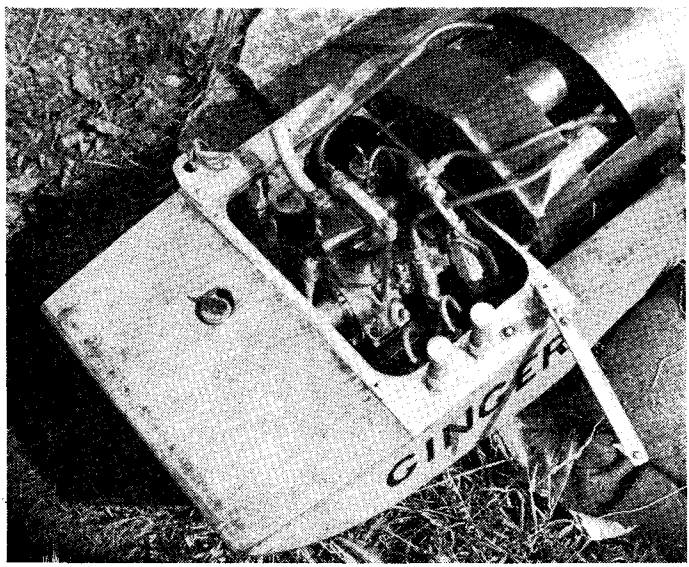
Result of "B" Class Race (300 yds.)

1st: Mr. F. Jutton (Guildford), *Vesta II*, 16.3 sec., 37.95 m.p.h.
2nd: Mr. J. Benson (Blackheath), *Erg*, 32.8 sec.

These two events having both been won by flash steam boats, there was some speculation as to whether Mr. Pilliner, now of the Southampton Club, could win the "A" class event with his flash steamer *Ginger*.

Mr. Martin (Southampton) with his new "C" class flash steamer "Zephyr"

Mr. Porter (Victoria) had brought his racing hydroplane *Toopyah*, but had the misfortune to bend the propeller shaft when tuning up, thus one boat was eliminated before the race started. Another very interesting boat was *Firefly III*, owned by Mr. Puntis (Southampton), which has a semi-circular shield fitted over its surface propeller. Mr. Walker (Malden) put up a good run at 35 m.p.h. with *Gilda*, but this was bettered by Mr. Pilliner's *Ginger* at about 39 m.p.h. This speed was not bettered until Mr. Williams, who had come all the way from Bournville for this regatta, managed to get a good run in with *Faro*, after quite a bit of accumulator trouble previously An unlucky competitor in this race was Mr. Pinder (Malden), whose boat *Rednip* capsized on both attempts.



The "engine room" of Mr. Pilliner's "A" class flash steamer "Ginger"

Result of "A" Class Race (600 yds.)

1st: Mr. Williams (Bournville), *Faro*, 31.2 sec., 39.3 m.p.h.

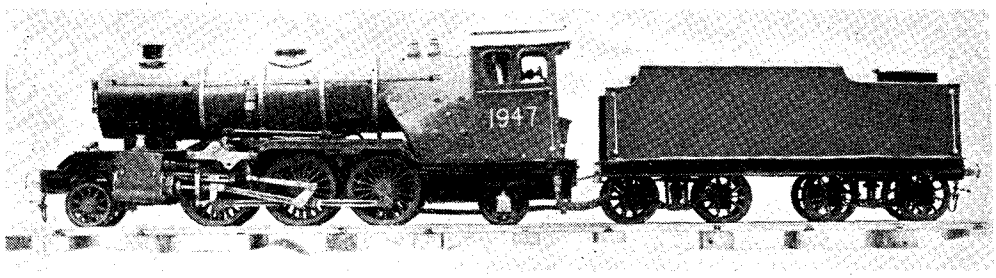
2nd: Mr. Pilliner (Southampton), *Ginger*, 31.5 sec., 38.9 m.p.h.

3rd: Mr. Walker (Malden), *Gilda*, 35 sec., 35 m.p.h.

A 2½-in. Gauge Cross-Breed "Bantam"

by C. V. Bavin

DURING the early days of the war, the sister to the "Bantam Cock" worked a train each day passing the place where I am employed. I was impressed by the general appearance so much that I felt a desire to make a model of her. My first trouble was that I had not seen any of the particulars of dimensions in print, so I made a rough outline drawing using the only measurement I knew of, which was the size of the coupled wheels, as a sort of base to work upon.



However, I went down to the station platform and took a few measurements when she stopped to pick up passengers and with these few particulars I was able to make up the frames from some bright 13-gauge mild-steel. I made a mistake when ordering the frame steel and was unable to make the frames all in one with the trailing end as in the prototype. As a result the frames carrying the rear track wheels were made as a separate unit attached to the main frames by a cross-beam just behind the trailing coupled wheels.

I was very fortunate at the time, to be able to get cylinder castings and wheels through Mr. Summerscales. The cylinders are as for the "Green Arrow" engine, $\frac{13}{16}$ in. by $1\frac{1}{8}$ in. These were machined up in the usual way and were fitted with stainless steel pistons packed with graphited yarn.

The slide valves work in buckles, the valve-spindles being carried through tail spindle glands and are set over to one side, the intention being to use the valve gear as designed by "L.B.S.C." for his "Dyak Queen."

However, whilst clearing up the workshop I came across two sets of Baker valve gear I made up some time previously for another engine and did not use. I decided to fit them to this engine, seeing that, when completed, it was going to be more or less free-lance.

When the gear was erected on the frames, in the desired position I found the connecting link between the valve-spindle and the bell-crank could only be very short and, owing to the valve-spindle and the piston-rod being close together, the link had to be indirect.

The guide-bars and crossheads are as used on the L.N.E.R. Crossheads are of steel in some six separate pieces brazed together. Guide-bars are of 3/32-in. by $\frac{3}{8}$-in. mild-steel, the bottom bar being slotted to take the crossheads. These proved to be a very fiddling job but looked well and acted as required. On test with an ordinary air pump, the Baker gear worked very nicely, giving a nice even beat to the exhaust.

The coupled wheels are provided with cast hornblocks with spiral springs underneath each axlebox. Coupling and connecting-rods were filed from $\frac{3}{16}$-in. by $\frac{3}{8}$-in. mild-steel and are fluted.

The front pony truck is built up from the "Green Arrow" drawings.

Trailing axle is provided with a combination of laminated and spiral springs, the axleboxes working in built-up hornblocks.

To clear the Baker gear the footplate is not like the "Bantam's" and is not at present considered satisfactory, and may be altered eventually.

Twin feed-pumps are fitted as per "Green Arrow" design, and both deliver into a clack-valve on the right-hand side of the boiler barrel.

A displacement lubricator is fitted between the frames in front but is going to be replaced by a mechanical one as soon as opportunity arises. The boiler is all-brazed, i.e., silver-soldered and brazed and is fitted with a short combustion-chamber containing five $\frac{3}{8}$-in. water-tubes. In the barrel there are seven $\frac{3}{8}$-in. flue tubes and two $\frac{13}{16}$-in. superheater tubes. The firebox is of wide pattern and a bit oversize, but seems to steam the boiler well with a thin fire.

From the photograph it will be noticed that the water-gauge is fitted on the side of the firebox wrapper, the water level being seen through the cab window.

Chimney, dome, and safety-valves were turned up from odd pieces of brass round stock.

The regulator is of the pin, pull-in-and-out type, the handle standing upwards for ease of manipulation.

The width over the footplating is much wider than it should be owing to the Baker gear and width over cylinders.

Seeing that I had departed from the design of the "Bantam," I went still farther, and provided a bogie tender of large capacity.

The bogie frames are built up from brass strip, which was intended to be what I believe is known in the furnishing trade as "Valence," rod. Axleboxes are made from ½-in. by ¾-in. brass rod, all being pinned and sweated together. The stretcher bars are of 16-gauge blue steel sheet with four coiled springs to each bogie.

The main frames of the tender are of girder-section, ordinary brass curtain-rail being utilised and silver-soldered to the buffer beams.

The body of the tender is of 20-gauge bright sheet brass, soft-soldered together, and contains a hand-pump, ⅝-in. bore and ¾-in. stroke, which deals quickly with an emergency.

Editor's Correspondence

Floating Cutters

DEAR SIR,—The article "A Floating Cutter," by Mr. R. Johnson in the August 19th issue was very interesting and I fully agree with his remarks.

Having used floating cutters quite considerably, I think, in order to prevent disappointment to "novices," that the following remarks will be of use.

Great care should be taken to grind the ends of the cutter as much alike as possible, otherwise an oversize bore will result. The cutting edges should be below the centre-line of the tool-bit to eliminate any tendency of the cutter to revolve within its support.

Now a warning: Floating cutters if used for boring castings can cause much damage if blow-holes or ports are present, as they will try, and generally succeed, in forcing their way into them. A casting should, therefore, not be bored by this means without thorough inspection.

To minimise this tendency and produce a size hole, negative top rake should be ground on the tool.

Yours faithfully,
Hailsham. R. T. A. BROWN, A.M.Inst.B.E.

"Support Home Industry!"

DEAR SIR,—Surely in the article on the above subject, Mr. Westbury is fussing about something which has gone beyond his control, like a hen with a duckling.

Competitive model flying and car racing is reaching, if it has not already reached, independence from its nursery of model engineering.

Like an ungrateful child, it will not look back, it is now not model engineering but competitive sport, and as in other competitive sports such as in motorcycle and car racing, then the owner-builder or modifier takes an equal chance against the manufacturer's entry.

True, efforts have been made in all these other sports to combat this, but eventually the two, amateur builder and professional, have competed on equal terms or not at all.

There have been cases, Mr. Westbury will agree, of the home-built entry of today becoming the commercial proposition of tomorrow.

The real reason why petrol engines have been able to establish themselves in the competition world is because of their cheapness. Many people can buy, maintain and tune them who cannot afford, or have not the practice or the machines necessary to make a complete engine.

It is these masses who make competitions possible and successful, the few who can make their own engines cannot be making engines and competing with them at the same time.

If Mr. Westbury were to carry out his ideals he would be asking THE MODEL ENGINEER to give bonus marks to competitors in the "M.E." Exhibition who had made their own tools.

No, Mr. Westbury, let the flying and car racing sections go their own way, and if a "real" model engineer can win on equal terms then good luck to him.

Yours faithfully,
Port Sunlight. GEORGE L. F. BONNETTE.

Remote-control Appliances

DEAR SIR,—We were very interested to read Mr. Turpin's article on the above subject in your issue of July 15th. Some of your readers might be interested to know that the Air Position Indicator, which we have been advertising recently, contains a repeater motor of the type mentioned in this article and illustrated schematically in Fig. 1. We are also able to supply these motors separately at 10s. 6d. each; your correspondent might have added that the Air Ministry pattern has a shaft approximately ¾ in. long.

In this same article appears a description of a solenoid; we have some *ex*-R.A.F. ones rated 24 v. but which we have found on test to work quite well from a 6 v. d.c. supply; this type has a shaft about 1 in. long, threaded to take a 4-B.A. nut. On applying current, the shaft moves ½ in. and with sufficient pull to operate any lightweight switches, etc., that may be attached. On switching off current, the shaft returns immediately to its position. We can readily supply a limited number of these at 5s. 6d. each—they are enclosed in a heavy case approximately 2 in. × 3 in. × 4 in. overall.

We are now, through the medium of your paper, doing a very large mail order trade indeed, but would like to point out that far too many customers are sending in letters with the addresses omitted, or written so badly that quite a number of instruments have failed to reach their destination.

Yours faithfully,
London. AERO-SPARES CO.

Treadle Design

DEAR SIR,—The unusual design of treadle with the vertical rear arm, which was the subject of Mr. K. N. Harris's letter, is illustrated and described by Holtzapffel in *Mechanical Manipulation*, Volume 4, page 49, published in 1879. He states that the design was invented by Mr. Lukins who claimed for it certain advantages. To quote the inventor's words :

> "A crank with a short connecting-rod, turns one of its dead points much more quickly than the other ; advantage is taken of that peculiarity in the arrangement of the crank in this lathe. The slow turn takes place at the bottom of the tread, and the too quick return upon the foot which occurs in the common mode is consequently avoided."

Holtzapffel comments in his next paragraph that the action of this treadle seemed (to him) less smooth and agreeable than that of the older form, but the design evidently persisted for at least another 40 years from the date of the description.

My own Milnes lathe has the chain drive mentioned by Mr. Dyer. That, and the very heavy flywheel, give a sweet-running treadle action. What is not immediately apparent from an illustration in a catalogue, is the revolving motion of the chains, when the treadle is at work, over the crank at the top, and the roller at the bottom.

Yours faithfully,
Tonbridge. E. M. GRANVILLE.

Club Announcements

South London Model Engineering Society

The following meetings will be held at Kings College Sports Ground, Dog Kennel Hill, East Dulwich.

September 29th. Mr. Griffin on "Steam Raising."
October 3rd. Ten-minute Talks.
September 25th and 26th. Two-day Regatta at Brockwell Park, Herne Hill, S.E. Visitors welcome.

Hon. Secretary: W. R. COOK, 103, Engleheart Road, Catford, S.E.6.

The Manchester Society of Model and Experimental Engineers

The above society held a very interesting "Bits and Pieces" night on Friday, September 3rd. There was a good variety of work to be seen, ranging from an "O" gauge locomotive by Mr. Beddle to a bias binder for a sewing machine made by Mr. Heworth. There were too many examples to give a complete list, but we must not omit the club's own 5-in. gauge locomotive.

On October 9th, 1908, this society held its first meeting, a lot of things have happened since, including two world wars. In spite of many ups and downs we are still going strong after 40 years. How many other clubs can claim such a record ?

At the meeting on Friday, October 8th, 1948, we are going to look out for the "oldest member"; whether he is a past or present member makes no difference, he will be very welcome, as, of course, will any other visitors.

Meetings are held every Friday, at 8 p.m., at the Girls' Institute, Mill Street, Ancoats, Manchester.

Hon. Secretary: GEORGE GARVIN, 13, Vernon Road, Droylesden.

Isle of Wight Model Engineering Society

The annual exhibition of the above society was held on August 18th, 19th, 20th and 21st, and was the most successful ever staged.

The opening ceremony was performed by Mr. H. L. Hutchinson, M.A. (County Education Officer), who urged the individual who was interested but had not yet made any models to "try his hand."

A very high standard was set by the judges, with the result that many exhibits of considerable interest, as opposed to technical merit, were unplaced.

Mr. A. E. Jones won both the society's Championship Challenge Cup for the best model, and the A. E. King Challenge Cup for the best locomotive, with his 2½-in. gauge "Baltic" tank.

Models were run under compressed air; petrol and compression-ignition engines were demonstrated at frequent intervals. A water tank in the adjoining playground attracted a large number of people when Mr. G. Baillie, of Shanklin, demonstrated his robot rowing-boat. Mention must also be made of Mr. G. Weeks' (vice-chairman) paddle steamer and tug, which were also sailed. A passenger-carrying railway track was in operation, Mr. Shephard's and Mr. Slade's locomotives during yeoman service.

The aircraft section was not quite up to previous entries. The most outstanding feature of this section was the models exhibited by Michael Crabb, aged 13. Michael has been a patient at the County Hospital, Ryde, for seven months, where the models were made, and his exhibits were a tribute to his courage and perseverance. He was awarded a special prize.

The society must not forget the film shows given by the I.W. Amateur Cine Society, which were a feature on all days.

Mr. L. C. Prebble, of Camp Hill, Newport, staged an interesting show of windmills, illustrating man's search for power from the wind from the earliest windmills of the Crusaders up to the 19th century.

Thanks are due to all who assisted in making the exhibition a success. To the Southern Federation of Model Engineers and the Andover Model Engineering Society who lent us models, we send our special thanks.

Hon. Secretary: V. C. RICHARDS, 13, Chapel Street, Newport, I.W. Asst. Hon. Secretary: R. G. SHEPARD, 153, Carisbrooke Road, Newport, I.W.

The City of Bradford Society of Model and Experimental Engineers

We are holding an exhibition of model engineering at the Mechanics' Institute, Bradford, from October 2nd to 9th, 1948, both dates inclusive. We extend to readers a hearty welcome to attend the opening ceremony or to visit us any time during the exhibition week.

The exhibition will be officially opened by the Lord Mayor of Bradford on the 2nd at 3 p.m.

Given support, we hope to have a very successful exhibition and look forward to seeing readers in Bradford.

Hon. Secretary: W. WOOD, 274, Hunsworth Lane, Cleckheaton.

The Society of Model and Experimental Engineers

The following arrangements have been made for meetings

September 25th. Rummage Sale at Workshop, at 2.30 p.m.
October 16th. Joint meeting with Radio-controlled Model Society, at Caxton Hall, Westminster, at 2.30 p.m.
October 30th. Stationary Engine Meeting at St. Peter's School, Gt. Windmill Street, W.1, at 2.30 p.m.
November 13th. Talk by Mr. Sparey on Lathe and Machine-tool Gadgets at Caxton Hall, Westminster, at 2.30 p.m. This is also Nomination Day.
December 18th. Annual General Meeting, at Caxton Hall, Westminster, at 2.30 p.m.

Hon. Secretary: E. L. ASHTON, 20, Pollards Hill West, Norbury, S.W.16.

NOTICES

The Editor invites correspondence and original contributions on all small power engineering and electrical subjects. **All such correspondence should be addressed to the Editor (and not to individuals)** at 23, Great Queen Street, London, W.C.2. Matter intended for publication should be clearly written, and should invariably bear the sender's name and address.

Readers desiring to see the Editor personally can only do so by making an appointment in advance.

All correspondence relating to sales of the paper and books to be addressed to THE SALES MANAGER, Percival Marshall & Co. Ltd., 23, Great Queen Street, London, W.C.2.

Correspondence relating to display advertisements to be addressed to THE ADVERTISEMENT MANAGER, "The Model Engineer," 23, Great Queen Street London, W.C.2.